Review of Managerial Science (2023) 17:1075–1123
https://doi.org/10.1007/s11846-022-00555-3

ORIGINAL PAPER

Voluntary CSR disclosure and CEO narcissism: the moderating role of CEO duality and board gender diversity

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Received: 16 March 2021 / Accepted: 19 April 2022 / Published online: 13 May 2022

Abstract

This paper seeks to contribute to the existing business strategies and corporate social responsibility (CSR) literature by examining the effect of CEO personality traits on CSR disclosure. Specifically, this paper aims to examine how chief executive officer (CEO) narcissism relates to voluntary CSR disclosure, and whether CEO duality and board gender diversity moderate this relationship. The study examines a sample of 322 S&P 500 firms over the 2012–2019 period (i.e., 1809 observations). Econometrically speaking, the study used the generalized method of moments (GMM). The results show that highly narcissistic CEOs are likely to disclose both socially-related and governance-related CSR activities. Furthermore, CEO duality positively moderates the relationship between CEO narcissism and (a) aggregated CSR disclosure, (b) social disclosure, and (c) corporate governance disclosure. Moreover, board gender diversity positively moderates the relationship between CEO narcissism and (a) aggregated CSR disclosure and (b) social disclosure. These results are robust to alternative econometric specifications and variable definitions.

Keywords Narcissism · CEO · Upper echelons theory · Socially-related disclosure · Governance-related disclosure · CEO duality · Board gender diversity

JEL Classification D21 · L21 · M14

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1 Introduction

Since the introduction of several corporate social responsibility (CSR) initiatives, reported by organizations such as the Global Reporting Initiative (GRI), ISO 260000, and the Bloomberg Impact Report, corporate social responsibility disclosure has been increasingly receiving attention (Stolowy and Paugam, 2018). Freeman and Reed (1983) state that social activities engagement became a reference criterion for investors on the prospects of companies. CSR has overtaken its primary role as an indicator of a company's commitment to environmental, social, and governance issues. It also gained investors' trust as a mechanism to reduce uncertainty, and therefore reduce firm risk. As a response, large firms specifically spend a great deal of effort and money on disclosing information on their social and environmental activities (Gamerschlag et al., 2010). According to the GRI website, GRI Standards are used by almost 7400 organizations located in over 110 countries, including 75% of reports issued by the world's largest 250 corporations and 93% of reports on their sustainability performance. CSR disclosure theoretically represents a prominent communication mechanism through which firms try to convince their communities that they respect their social contract by making their CSR commitments verifiable and therefore credible and they satisfy them a sense of 'social contract' (Mobus, 2005). Other authors claim that CSR activities are disclosed to enhance performance (Mathews, 1997). Indeed, CSR disclosure gives the impression of doing good by publishing CSR information that meets or exceeds stakeholder expectations (Brooks and Oikonomou, 2018). Therefore, CSR disclosure may be the perfect opportunity to signal transparency to shareholders and potential investors (Minutolo et al., 2019; Nair et al., 2019).

Unfortunately, the recent scandals leave room to believe that there is a gap between CSR disclosure content and CSR commitment (Nekhili et al., 2017). Specifically, managers may be reluctant to integrate sustainability into their corporate strategies given the possibility of allocating resources to certain actions that do not support their interests (García-Sánchez and Martínez-Ferrero, 2019). There are strong intuitive beliefs that firms spend more money and time on pretending to be responsible than on being effectively responsible (Panwar et al., 2014). Indeed, elaboration of voluntary CSR disclosure is expensive; it can be linked to a search for complementary positive effects for companies other than the concealment of less suitable practices. Therefore, there growing trend calls for not trusting CSR disclosures (Du et al., 2010).

Under this prism, voluntary CSR disclosure could also be motivated by opportunistic purposes to manipulate external opinions about the firm's behavior or to manage relationships with a specific group of stakeholders (Li et al., 2018). Furthermore, firms can enhance their brand image and signal a false responsible and ethical identity to impress stakeholders and satisfy activists' demands (Michelon et al., 2020; Ting, 2020). Some companies also seem to engage in selective disclosure practices, disclose fake information, or even choose to disclose the minimum required (Minutolo et al., 2019; Perks et al., 2013).

In this regard, empirical studies have attempted to identify determinants of CSR disclosure. They focused on external motives such as stakeholders' pressure (Chantziaras et al., 2020a), institutional environment (Chantziaras et al., 2020b), and ownership structure (Gamerschlag et al., 2010). CSR disclosure seems to be determined by contextual and institutional factors than internal pressures such as ethical concerns, or key organizational members (Petrenko et al., 2016). Research has now turned to focus on the relationship between CSR disclosure and the characteristics of CEOs like power (Muttakin et al., 2018), education (Lewis et al., 2014), and CEO ability (García-Sánchez et al., 2020).

Recently, some studies pointed to the importance of managers' dark personality traits in the organizational environment (Paulhus and Williams, 2002). According to psychological theory, Machiavellianism, narcissism, and psychopathy are the most prominent negative personality traits (Paulhus and Jones, 2015). Previous research has highlighted the problems that may arise when people with dark personality traits are at the top management level (Babiak et al., 2006; Petrenko et al., 2016). Dark personality traits relate to unethical decision-making, lack of guilt and remorse, and a sense of superiority (Babiak et al., 2006; Boddy, 2006; Furnham et al., 2013; Hauser et al., 2021; Paulhus and Williams, 2002). In this study, we consider one attribute of 'dark personality traits'—narcissism- to extend the literature on the determinants of CSR disclosure. Narcissistic individuals are known for their belief in their supreme sense of leadership and their tendency to describe their professional performance more positively. They also push for and anticipate applause and attention from others to feed their over-estimated self-image (Fatfouta, 2019; Marquez-Illescas et al., 2019). Indeed, the fact of going unnoticed represents the main threat to the ego of a narcissist (Gerstner et al., 2013). Therefore, they tend to always opt for actions with the best visibility instead of devoting their efforts to more low-key activities (Ahn et al., 2020).

The upper echelons theory developed by Hambrick and Mason (1984) and Hambrick (2007) provides a suitable framework to explain the role of the CEO in CSR activities and disclosure. It suggests that the CEO is the most influential decision-maker in each organization (Kim and Sambharya Yang, 2016). Under this perspective, CSR disclosure offers them the opportunity to describe their non-financial performance and to portray an image based on the values of solidarity, justice, loyalty, and transparency. Consequently, through these disclosures, more narcissistic CEOs achieve their goals by enhancing their public image and generating admiration, legitimacy, and self-esteem. Furthermore, given that CSR disclosure allows them to target a wider audience than financial reporting outlets like media, it seems therefore meaningful to explain voluntary CSR disclosure by taking into account CEO characteristics and personality traits like their big ego or narcissism.

The role of CEO narcissism as an internal determinant of CSR remains, however, a poorly investigated area despite the evidence indicating that CEOs may exhibit common personality traits such as narcissism. To fill this gap, this paper aims to examine the effect of CEO narcissism on CSR disclosure. This choice was further influenced by the dark nature of this personality dimension and its divergent outcomes (Al-Shammari et al., 2019; Fatfouta, 2019). Indeed, few previous studies have attempted to investigate the relationship between narcissism and CSR (Ahn

et al., 2020; Al-Shammari et al., 2019; Petrenko et al., 2016). This study is, however, the first, to our knowledge, to consider voluntary CSR disclosure rather than CSR performance. This is particularly important, especially in light of such a personality trait that often relates to competitiveness, selfishness, and corruption, as it does not deny the possibility of hypocrisy in the reported figures. Although some researchers tend to consider and use CSR disclosure scores as indicators of CSR performance. Han et al. (2020) distinguished between actually fulfilled CSR activities and disclosed CSR activities. In this regard, disclosed CSR activities could deviate from the real CSR commitment (Panwar et al., 2014).

To deepen our analysis, we refer to Chatterjee and Hambrick (2011, p. 204) who state that "the psychology of narcissism has substantial implications for how individuals respond to organizational strategies. However, these implications are not straightforward". This quote points toward the presence of moderators that could explain better the effect of narcissism on organizational strategies like CSR disclosure. In this study, we theorize and empirically test that CEO duality and board gender diversity will reduce or strengthen the use of CSR disclosure for opportunistic purposes.

In this regard, the dual position of CEO-chairman of the board could affect the relationship between CEO narcissism and CSR disclosure. Indeed, the dual role of the CEO can influence corporate strategies including those related to CSR disclosure. As such, CEOs may (not) be motivated to invest in CSR practices if such practices (do not) serve their interests (McWilliams, et al., 2006; Borlea et al., 2017). Depending on how CEOs tend to use that power, the relationship between CEO narcissism and CSR disclosure will be affected.

Moreover, board gender diversity is another factor that could moderate the effect of CEO narcissism on voluntary CSR disclosure. To determine the moderating effect of board gender diversity, we refer to psychological and emotional features. Indeed, women show more sensitivity toward the interests of others and try to understand the multiple perspectives of stakeholders (Byron and Post, 2016; Harjoto et al., 2015). They are more likely than men to engage in charitable activities (Williams, 2003). This can lead female directors to provide a better link with stakeholders as well as generate a stronger commitment to CSR disclosure (Ntim and Soobaroyen, 2013). Hence, board gender diversity can also affect the relationship between CEO narcissism and disclosure.

An emerging stream of research has focused on how CEOs' narcissism influences their firms' CSR strategies (Ahn et al., 2020; Al-Shammari et al., 2019; Kim et al., 2018; Petrenko et al., 2016) and how CEO duality and board gender diversity affect CSR disclosure (Rashid et al., 2020; Chau and Gray, 2010; Malik et al., 2020; Pucheta-Martínez and Gallego-Álvarez, 2021; Byron and Post, 2016; Harjoto et al., 2015; Ntim and Soobaroyen, 2013; Jizi et al., 2013; Liao et al., 2015). Nonetheless, to the best of our knowledge, no study has examined the relationship between CEO narcissism and voluntary CSR disclosure nor the moderating effect of CEO duality and board gender diversity on this relationship. This paper aims to fill this gap by pursuing the following research objectives. The first is to explore whether CEO narcissism plays a role in firms' decisions to disclose CSR information. The second

is to investigate whether CEO duality and board gender diversity moderate the relationship between CEO narcissism and voluntary CSR disclosure.

Examining a sample of 322 companies listed on the Standard and Poor's 500 index observed from 2011 to 2019, we construct a narcissism score using the method suggested by Chatterjee and Hambrick (2007, 2011). Moreover, we apply the generalized methods of moments (GMM) to control for the potential endogeneity problems and sample selection. Overall, consistent with the theoretical views of upper echelons theory, our present study examines the assumption that highly narcissistic CEOs are more prone to voluntarily disclose CSR activities relative to social and corporate governance activities. These results confirm that more narcissistic CEOs tend to disclose CSR activities to attract more attention and applause. Particularly, we found that the more narcissistic CEO seems to show a specific preference for social disclosure than corporate governance disclosure. Finally, the results reveal that the positive effect of CEO narcissism on voluntary CSR disclosure is more pronounced in companies with dual CEO roles and with a more female presence on the board.

We seek to contribute to the previous literature as follows. *First*, by drawing on the theoretical insights of upper echelons theory (Hambrick and Mason, 1984; Hambrick, 2007), we examine the impact of CEO narcissism on voluntary CSR disclosure preferences, less studied in depth so far. Our findings reveal that this CEO personality trait plays an important role in determining voluntary CSR disclosure. By doing so, we extend the recent research on the effects of CEO narcissism, as an attribute of managers' dark personality traits, on strategic choices and activities within companies (Chatterjee and Hambrick, 2011; Lin et al., 2020; Kim et al., 2018). *Second,* by separating the measures of the two CSR components, social and governance, of voluntary disclosure, we theorize and empirically test if highly narcissistic CEO are careful about all CSR disclosure dimensions. This proposal expands those of Al-Shammari et al. (2019) indicating that these CEOs disclose only externally oriented CSR activities and highlighting that highly narcissistic CEOs could enhance corporate governance disclosure without implementing these activities. Such an assumption thereby validates the presence of a CSR gap between performance and disclosure. Therefore, we extend research on the personality traits of CEOs by contributing to previous studies of whether the two dimensions of voluntary CSR disclosure act homogeneously. *Third,* by comparing the effect of CEO narcissism on social and corporate governance disclosure and by testing what dimension mainly explains our results, we provide a first glimpse of the influence of CEO narcissism on governance and social CSR disclosure. We confirmed that highly narcissistic CEOs place greater emphasis on social disclosure than on corporate governance disclosure because it enhances their public image and generates admiration. *Fourth*, this paper contributes to the literature, by highlighting the moderating effect of CEO duality on the relationship between CEO narcissism and CSR disclosure. To our knowledge, this is the first paper that examines the role of CEO duality in encouraging CSR disclosure by more narcissistic CEOs. *Fifth,* this study also contributes to the gender diversity literature on the effect of board gender diversity on CSR disclosure (Byron and Post, 2016; Harjoto et al., 2015; Ntim and Soobaroyen, 2013; Jizi et al.,

2013; Liao et al., 2015). Although recent research has examined this diversity as a determinant of CSR commitment, as far as we know, our study is the first to explore the moderating role of board gender diversity in the relationship between CSR disclosure and CEO narcissism.

Finally, given the dynamic and complex nature of CSR disclosure and the fact that it cannot be fully explained by an individual theoretical perspective (Haque and Ntim, 2018), this study expands on the previous literature by embedding a moderating effect within a multi-theoretical framework, including upper echelon theory, stakeholder theory, agency theory, and social role theory, to study the impact of CEO narcissism on voluntary CSR disclosure. We thus give valuable information for understanding the moderating role of CEO duality on the relationship between CEO narcissism and voluntary CSR disclosure.

The remainder of this paper is structured as follows. The second section presents the theoretical framework and develops the research hypotheses. The third section describes the sample and the research design. The fourth section presents and discusses the results and the fifth section concludes the paper.

2 Theoretical framework and hypothesis development

Numerous studies have attempted to explain why companies voluntarily disclose CSR information (Dowling and Pfeffer, 1975; Guthrie and Parker, 1989; Patten, 1991). Indeed, business organizations place greater attention on their CSR image by allocating more resources to CSR activities and rallying to communicate their commitment to their stakeholders through different channels (Bingham et al., 2011). Nevertheless, abundant evidence highlights a gap between CSR disclosure content and the execution of CSR programs. There has also been a parallel increase in research on CSR, much of which focuses on the factors and outcomes of CSR disclosure. Interestingly, most of the previous research seems to examine the external factors that drive managers and their organizations to disclose CSR activities to respond to multiple stakeholders' demands (Hoffman, 2001; McWilliams and Siegel, 2000, 2001).

The ongoing debate between scholars and practitioners on the main motive of CSR disclosure focuses more on external drivers such as contextual and institutional factors than internal drivers such as ethical concerns, or key organizational members, although internal factors might have an equal influence on CSR disclosure (Petrenko et al., 2016). Recently, researchers have explored the effect of "within-firm" variables rather than contextual factors (Chin et al., 2013). In this regard, Margolis and Walsh (2001) state that it is time to move on to a different line of research on CEO attributes and CSR.

The upper echelon theory developed by Hambrick and Mason (1984) and Hambrick (2007) provides a suitable framework to explain the role of the CEO in CSR activities and disclosure. It suggests that the CEO is the most influential decision-maker in each organization (Kim and Sambharya Yang, 2016). Managers act according to their assessment of the strategic environment they face (Hambrick, 2007). Despite the importance of the role of the CEO in CSR disclosure, previous research

on this theme has largely focused on observable attributes than personality traits like CEO gender (Manner, 2010; Alonso-Almeida et al., 2015), CEO tenure (Malik et al., 2020), CEO duality (Ahmad et al., 2017), CEO age (Farh et al., 1998), CEO ownership (Chau and Gray, 2010; Eng and Mak, 2003; Khan et al., 2013), CEO education (Hambrick and Mason, 1984; Herrmann and Datta, 2002; Manner, 2010; Malik et al., 2020), and CEO power (Rashid et al., 2020).

Although the above literature illustrates the effect of the background, experience, and other observable traits of CEOs on CSR disclosure, previous studies did not investigate how CEO personality traits, important voluntary disclosure attributes under the upper echelon theory, affect CSR disclosure. Relevant to the upper echelon perspective, this study extends the previous literature and focuses on the CEO's new personality trait, CEO narcissism. Indeed, CEO values, reflected in personality, can either incite CEOs to adopt socially responsible practices, whether for noble or selfish reasons or deter them from engaging in this kind of activities (Tang et al., 2015).

2.1 CEO narcissism and CSR disclosure

Several authors have linked narcissism to CSR. Petrenko et al. (2016) found that in their pursuit of visibility and self-image glorification, more narcissistic CEOs tend to invest in certain CSR activities despite their effect on financial performance. In the same vein, Al-Shammari et al. (2019) found that narcissism positively affects external CSR initiatives rather than internal ones. This results, again, from the search for high visibility and neglecting of discreet activities. In addition, Tang et al. (2015) show that narcissism has a significant effect on strategic decision-making and information processes and affects the intention to engage in CSR reporting activities and choices.

Unlike the studies that have focused mostly on CSR performance, we are interested in studying the impact of narcissism on CSR disclosure. Then, we are strongly interested in narcissism as a factor affecting the will to disclose and spread information rather than a factor influencing the actual engagement in CSR activities. This could be especially motivated by the new trend of "awards" granted to the most remarkable CEOs that could further fuel and stimulate their competitive spirit (Chatterjee and Hambrick, 2011). It has also been shown that engaging in CSR activities contributes to the creation of connections and important professional networks (Luo and Liu, 2020). Such connections help the CEO, on the one hand, to boost their entourage and thereby social rank, and on the other hand, to acquire professional security (Lee, 2007). Therefore, CEOs' arrogance, dominance, competitiveness, immoral nature, and participation in hypocritical disclosure activities are not surprising (Fatfouta, 2019). In other words, even if the company does not engage in considerable CSR activities and does not reflect a good performance score, more narcissistic CEOs may falsely communicate CSR information to gain acceptance and admiration. This manipulation could occur despite the CSR report assurance adoption. Indeed, the Corporate Register in its 2012 report on corporate responsibility reporting, for example, notes that 90% of CSR reports in the USA do

not include an assurance statement. More recently, the survey of Si2 and IRRC Institute (2018)[1] on CSR reporting in the USA highlighted that a minority (about 38%) of S&P 500 firms obtain external assurance, and 90% of these pertain only to some data, in most cases greenhouse gas emissions. Accordingly, the following hypothesis (H1) is formulated:

H1 *CEO narcissism has a positive effect on CSR disclosure.*

There is a growing awareness to consider the effect of each CSR dimension separately. Indeed, an aggregate score does not give an accurate and realistic picture of a firm's commitment to CSR (Aguinis and Glavas, 2017), as companies may be interested in specific activities or dimensions more than others (Gosselt et al., 2017). The highly narcissistic dimension of a CEO's personality does not only affect their intrapersonal skills but also affects their interpersonal relationships and their sense of judgment (Fatfouta, 2019). Therefore, it is anticipated that more narcissistic CEOs will tend to focus more on specific CSR categories than on others (Ahn et al., 2020). As most stakeholders' biggest concerns are social, less concern and attention are given to internal corporate matters. This study classifies CSR activities into social and governance-related activities. Therefore, to further explore the impact of CEO narcissism on voluntary disclosure, we distinctively develop the following sub hypotheses pursuing the two voluntary CSR disclosures, (a) social disclosure and (b) corporate governance disclosure. The environmental pillar is not considered in this study, despite its significant contribution to these practices, because of the decision of the Environment Protection Agency (EPA) to require disclosure of certain environmental activities, which risks skewing our results.

Amongst the main factors that motivate more narcissistic CEOs to engage in a CSR policy is their visibility search (Petrenko et al., 2016; Al-Shammari et al., 2019). Indeed, the fact of going unnoticed represents the main threat to the ego of the narcissist (Gerstner et al., 2013). Therefore, they tend to always opt for actions with the best visibility instead of devoting their efforts to more low-key activities (Ahn et al., 2020). Specifically, social disclosure highlights the extent to which firms are involved in social activities serving people and culture and respecting human rights, labor standards in the supply chain, and ensuring workplace health and safety. Social disclosure improves a firm reputation, restores the trust of stakeholders, and often copes with media and consumer skepticism (Morsing and Schultz, 2006).

For the narcissist, who seeks out the role of the protagonist while anticipating reassertions and applause from "spectators", social disclosure allows them to play the role of the hero (Tang et al., 2018). Indeed, disclosure of these social actions touches and stimulates the interest of stakeholders and the general public. As social-related activities tend to generate more attention through advertisements and events dedicated to announcing and above all celebrating them, it represents the ideal opportunity for CEOs to introduce themselves even if they have to fake their contributions, hence the following sub-hypothesis:

H1a *CEO narcissism has a positive effect on social disclosure.*

[1] https://corpgov.law.harvard.edu/2018/12/03/state-of-integrated-and-sustainability-reporting-2018/.

CEO narcissism largely affects their leadership style and their relationship with their subordinates and coworkers. Their arrogance incites them to ignore any suggestions or collaboration coming from their teams resulting in bad decisions, and negative work atmospheres (Fatfouta, 2019). Along with the many ethically unacceptable practices, such as fraud (Amernic and Craig, 2010) and tax sheltering (Olsen and Stekelberg, 2016) that have been linked with this trait, more narcissistic leaders are often positively linked with a bad governance style. Indeed, Al-Shammari et al. (2019) found that highly narcissistic CEOs are unlikely to engage in governance-related CSR activities because of the moderate level of attention they reflect. Narcissists' self-absorption mode makes them oblivious to any endeavor that does not provide them with personal benefits.

In contrast, highly narcissistic CEOs are obsessed with the public's perception of their image. Then, they are not interested in divulging information that threatens their image, sincerity, and honesty. This is why they tend more to disclose information that shows respect to shareholder rights, anti-bribery, anti-corruption, and anti-competitive practices, even if it means resorting to selective disclosure to hide their unethical practices, particularly, because corporate governance disclosure is less concerned with CSR report assurance.

Furthermore, narcissistic CEOs will place greater emphasis on corporate governance disclosure to satisfy market participants (Khanchel and Ben Taleb, 2022). In this sense, many studies highlighted the importance of governance quality for market participants. For instance, Giannetti and Simonov (2006) found that domestic and foreign investors who generally enjoy only security benefits are averse to investing in companies with poor corporate governance. Similarly, Bushee et al. (2009) confirm that large institutional investors who hold a large number of firms, choose better-governed firms to reduce monitoring costs. Lassoued and Elmir (2012) highlighted that corporate governance has an impact on portfolio selection. Recently, Ramón et al. (2021) demonstrated that an increase in corporate governance disclosure will increase return growth, and reduces the frequency and intensity of shocks to corporate performance.

Then, we formulate the following sub hypothesis.

H1b *CEO narcissism has a positive effect on corporate governance disclosure.*

2.2 The moderating effect of CEO duality

Bearing on upper echelon theory (Chatterjee and Hambrick, 2007), the effect of CEO narcissism on CSR disclosure could depend on the degree of dominance of the CEO. Generally, this dominance is associated with CEO duality, notably when the CEO also serves as the board's chairman (Khanchel, 2007b).

The moderating role of CEO duality on the relationship between CEO narcissism and CSR disclosure is elucidated by the following argument. Under agency theory, managers are often self-motivated, and they mainly focus on maximizing their benefits at the expense of principals (shareholders) (Jensen and Meckling, 1976), especially when the same person holds both titles (chairman and CEO). Combining the positions of chairman and CEO confers greater power to the CEO (Khanchel,

2007a). CEO power affects key firm outcomes and allows CEOs to act in their interests and not necessarily in those of stakeholders (Morck et al., 1988; Pucheta-Martínez and Gallego-Álvarez, 2021). Therefore, the engagement of more powerful CEOs in CSR activities will depend on their private interests. They will engage more (less) in CSR activities if it corroborates (or not) their interests (McWilliams, et al., 2006; Borlea et al., 2017).

CEO duality, through a reduction of the board's monitoring ability (Mallette and Fowler, 1992), enables more narcissistic CEOs to allocate substantial attention to seek praise and appreciation. Thus, when narcissistic CEOs hold the role of chairman, they are likely to allocate more attention to voluntary CSR disclosure. Moreover, CEO duality grants narcissistic CEOs increased autonomy to disclose the CSR activities they are interested in. Specifically, CEO duality, by providing CEOs with formal authority, enables them to take self-serving actions in a relatively uncontrolled manner (Finkelstein and D'aveni, 1994).

From the upper echelon perspective, narcissism is acknowledged as a source of self-absorption and egocentrism that helps CEO to have more power and show off whenever they get the chance. CEO duality grants more narcissistic CEOs increased autonomy to freely allocate their attention. CEO duality, through a reduction of the board's monitoring ability (Mallette and Fowler, 1992), enables more narcissistic CEOs to allocate substantial attention to seek praise and appreciation. Then, when narcissistic CEOs hold the role of chairman, they are likely to allocate more attention to voluntary CSR disclosure. Moreover, CEO duality grants narcissistic CEOs increased autonomy to disclose the CSR activities they are interested in. Specifically, CEO duality, by providing CEOs with formal authority, enables CEOs to take self-serving actions in a relatively uncontrolled manner (Finkelstein and D'aveni 1994). Therefore, we expect the effect of narcissism on CSR disclosure to be more likely in firms with CEO duality.

The preceding discussion affirms that when the highly narcissistic CEO is also the board chairman, he will dispose of more freedom and will engage in more CSR disclosure. Indeed, CSR disclosure serves the objective of feeding their over-estimated self-image (Horvath and Morf, 2010) and satisfying their concern with fantasies of unlimited success or power, and beliefs of being special.

Therefore, we expect that the positive effect of CEO narcissism on CSR disclosure to be more observed when the CEO plays a dual role. We formulate the following hypothesis and sub-hypotheses:

H2 *The positive effect of CEO narcissism on CSR disclosure is more observable with CEO duality.*

H2a *The positive effect of CEO narcissism on social disclosure is more observable with CEO duality.*

H2b *The positive effect of CEO narcissism on corporate governance disclosure is more observable with CEO duality*.

2.3 The moderating effect of board gender diversity

Board gender diversity is another factor that can strengthen the relationship between CEO narcissism and CSR disclosure. The moderating role of board gender diversity in this relationship is explained by referring to stakeholder theory and social role theory. *First*, stakeholder theory highlights that a more gender-diverse board is more likely to represent the different stakeholders, by bringing different ideas, skills, and perspectives to board decision-making (McGuinness et al., 2017). Indeed, female directors seem to have different educational and professional backgrounds outside of business than male directors (Cabeza-García, et al., 2018). *Second*, under the social role theory, women better embrace ethical values than men, and this leads to differences in male and female aspirations for moral principles. Specifically, social role theory postulates that females are thought to be more communal, unselfish, compassionate, and emotionally expressive, while males are competitive and dominant (Eagly, 2009). Women directors are therefore more inclined than men to recognize situations requiring ethical judgments and behaviors (Eagly, 2009). In this regard, Cabeza-García et al. (2018) highlighted that women are shown to be more oriented toward non-profit activities and less sensitive about firms' financial needs and they are expected to increase accountability and boost ethical behavior. Therefore, board gender diversity could be considered a key factor that promotes commitment to CSR activities and disclosure (Jizi et al., 2013; Liao et al., 2015). In the case of firms managed by highly narcissistic CEOs, female directors' tendency to increase CSR transparency is welcomed because it will allow these CEOs the opportunity to satisfy their constant need to reinforce their grandiose self-image.

Bearing on the previous arguments we expect that the positive effect of CEO narcissism on CSR disclosure to be more likely observable in firms with a high presence of women in the board of directors. Therefore, we formally present a moderating effect of board gender diversity on the relationship between CEO narcissism and voluntary CSR disclosure. Accordingly, we propose the following hypothesis and sub-hypotheses:

H3 *The positive effect of CEO narcissism on CSR disclosure is higher in firms with a gender diversified board.*

H3a *The positive effect of CEO narcissism on social disclosure is higher in firms with a gender diversified board.*

H3b *The positive effect of CEO narcissism on corporate governance disclosure is higher in firms with a gender diversified board.*

3 Empirical analysis

3.1 Sample and data sources

We drew our sample from the Standard and Poor's 500 index during the 2012–2019 period, for two reasons. First, these companies are forced by law to publish data on their TMT and make them accessible to the public, which is a key factor for this study. Second, S&P 500 includes the largest US companies listed on the NYSE and

Table 1 Sample selection

	Firm-year observations	Firms
S&P 500 companies between 2011 and 2019		505
Non-missing data for CSR score	3376	482
Non-missing financial data	2682	404
Available Narcissism measure	1809	322

NASDAQ, making them more exposed to considerable stakeholder attention, and more likely to voluntary disclosure practices (Patelli and Matteo, 2014).

To compile our sample, we first identified the 505 public companies listed on the S&P 500 index between 2012 and 2019. Second, we narrowed our sample to firms with complete (non-missing) data on CSR disclosure from the Bloomberg dataset, financial data from DataStream, and executive compensation data from ExecuComp. Table 1 reports the sample selection process.

Like Chatterjee and Hambrick (2007), we identified the CEOs for every firm-year in this period and then applied two filters. First, we only selected those CEOs who started their tenures (designated as year t) in 2000 or later.[2] Second, we considered only those CEOs who had four or more years of tenure within our time panel. These two filters generated 408 CEOs in 322 unique firms, Disclosure data were taken from the Bloomberg database. Accounting and governance data were either taken from the DataStream database and Thomson Reuters. Data on the prominence of CEO photographs are hand-collected from the firms' annual reports available on their Web sites.

3.2 Variables and measures

3.2.1 Dependent variables

To measure voluntary CSR disclosure, we use three ESG Bloomberg scores: an Aggregate CSR disclosure (SG_DS), a Social oriented CSR disclosure (SOC_DS), and a Governance-related CSR disclosure (GOV_DS). These scores are based on GRI's guidelines that range from 0 to 100.

Aggregate CSR disclosure (SG_DS)[3]: We construct our measure of voluntary CSR disclosure, as the average of the firm's social disclosure score and corporate governance score.[4] Environmental CSR disclosure is not considered given the EPA's decision on the requirement to disclose some environmental activities, which are not any more voluntary (Khanchel et al., 2022).

[2] We retain the year 2000 because information about executive compensation is unavailable before this date.

[3] For more details see "Appendix".

[4] Many studies have used a CSR average score of selected dimensions (eg. Ghoul et al., 2016).

Social-oriented CSR disclosure (SOC_DS): To capture sensitive and salient concerns for society such as human rights, social equity, consumer safety, relationship with the community, (etc.), the social disclosure score is used as a measure of social-oriented CSR disclosure.

Governance-related CSR disclosure (GOV_DS): The governance disclosure score is used as it exposes information about board diversity, anti-competitive practices, corruption within the company, etc.

3.2.2 Independent variable

To measure CEO narcissism, we calculated a score based on averaged data (related to 4 items explained below) from the second and third year of CEO tenure (years t+1 and t+2). Next, we use these averages to determine a narcissism score. This score, consistent with the psychology literature, is assumed constant during the whole period of study. We omitted the first year because it often has anomalies associated with succession (Chatterjee and Hambrick, 2007, 2011).

The measure of Chatterjee and Hambrick (2011) of CEO narcissism is invariant, reflecting the prevailing view of personality theorists that narcissism is a relatively stable disposition (Livesley et al., 1993).

To identify narcissism, we used 4 items to form a narcissism index proposed by Chatterjee and Hambrick (2011) with some minor adaptations that are necessary for this study.

The items are measured as follows:

First, we measure the prominence of the CEO's photograph in annual reports (ProAR). Ratings range between 1 and 5 as follows: 5 points are awarded if the photo shows the CEO alone and takes more than half a page, 4 points if the CEO is alone in the photo which takes less than half a page, 3 points if the photo shows the CEO and one (or more) other TMT member (s) and takes more than half a page, 2 points if the photo shows the CEO and one (or more) other TMT member (s) and it takes less than half a page and 1 point if there is no photo or if the firm has not published an annual report (Zhu and Chen, 2015).

Second, we determine the prominence of the CEO's photograph in CSR reports as an alternative to the prominence of the CEO in press releases (ProCR). Because of the huge number of press releases published each year and the unavailability of a database covering these publications on the websites of some companies, like Lin et al. (2020), this indicator is replaced with the prominence of the CEO photograph in CSR reports. The same rating as that of the previous indicator is used.

Third, we calculated the CEO's relative cash pay (RCashP), by dividing the CEO's cash compensation (salary and bonus) by that of the highest-paid non-CEO executive.

Finally, we calculated the CEO's relative non-cash pay (RNoneCashP), by dividing any compensation beyond the CEO's salary and bonus by that of the highest-paid non-CEO executive.

Table 2 shows the prominence of CEO photographs in annual and CSR reports. It ranges between 1 and 5, with means of 2.513 and 2.17 respectively. On average, CEO cash pay is 54.4% more than that of the highest-paid non-CEO executive,

Table 2 Statistics for the narcissism measure

Variables	Mean	SD	Min	Max	(1)	(2)	(3)	(4)	Factor loadings
Panel A									
(1) ProAR	2.513	1.426	1	5	1.000				0.453
(2) ProCR	2.17	1.373	1	5	0.418***	1.000			0.502
(3) RCashP	1.544	0.407	0.0001	2.57	0.263***	0.320***	1.000		0.554
(4) RNon-eCashP	2.161	2.034	0.818	7.662	0.187***	0.297***	0.501***	1.000	0.741

Panel B: Paired *t* test				
	CEO_1	CEO_2	Difference	*t* student
Narcissism score	0.0253	0.001	0.0239	(3.21)***

Panel C: Spearman correlation		
	CEO_1	
CEO_1	−0.26	

*** significant at 1% level

while CEO non-cash pay is 2.16 times that of the highest-paid non-CEO executive. These findings imply that CEOs are more likely to be compensated in alternative means of payment such as stocks and stock options. In our sample of CEOs, the relative cash pay and relative non-cash pay have a correlation of 0.501, and the prominence of CEO photograph in annual reports has a correlation of 0.418 with the prominence of CEO photograph in CSR reports. All correlations are significant (at $p < 0.01$), showing that these four indicators quantify a common construct. We next conduct a factor analysis using these four items. All four indices loaded on a single factor (with loadings above 0.40) with an Eigenvalue of 1.68 explaining 38% of the variance. All indices were at or above the recommended standards (Comparative Fit Index = 0.912, Tucker-Lewis Index = 0.811, Standardized Root Mean Square Residual = 0.04, and Coefficient of Determination = 0.88). Furthermore, Cronbach's alpha for the standardized values of the four indicators was 0.7015.

To compute the narcissism index (CEO_NAR), we standardized and calculated the mean of the four measures for each CEO, in a way that each CEO will have the same narcissism score for the entire period.

Finally, we checked whether the narcissism index does not reflect firm policies and practices and reflects CEOs' actual narcissism. We compare the narcissism score of two groups of CEOs who managed the same companies. More specifically, we had 408 CEOs in 322 firms, and 86 companies had two CEOs represented in our sample. For each firm of the 86 firms, we denote CEO_1 the first CEO and CEO_2 the second CEO. As shown in panel B of Table 2, the difference between the narcissism score of the two groups is statistically significant. Moreover, the overall Spearman correlation between the two groups of CEOs (CEO_1 and CEO_2) is − 0.26, suggesting that our narcissism scores do not relate to persistent company tendencies.

3.2.3 Moderating variables

CEO duality and board gender diversity have been selected as moderating variables. CEO duality (CEO_DUAL) is a dummy variable that takes 1 if the CEO is the chairman of the board and 0 otherwise. Board gender diversity (B_GEN) is measured by the proportion of female directors within the board.

3.2.4 Control variables

We included several variables to control for CEO attributes, board, and firm characteristics. As for CEO traits, age (CEO_AGE) was controlled because senior CEOs are less likely to invest in CSR practices because of their shorter career horizons and higher risk aversion. However, younger CEOs tend to engage in CSR activities because of their higher sense of innovation and willingness to take a risk (Faccio et al., 2016). This variable represents CEO age in years.

CEO gender (CEO_GEN) is a dummy variable that takes 1 if the CEO is female and 0 otherwise. CEO gender affects their risk-taking and investment decisions as highlighted in many previous studies. More specifically, it has been shown that women in CEO positions are more likely to disclose CSR activities (Liu, 2018).

Board size (B_SIZE), representing the total number of directors on the board, was controlled. Board size positively correlates with CSP and CSR disclosure (Jizi et al., 2013).

Board independence (B_IND) is the proportion of independent directors within the board. It has been shown that the presence of independent directors serves as a controlling tool to diminish agency conflicts and information asymmetry (Sundarasen et al., 2016). Given their strong stakeholder orientation and their diverse backgrounds, independent directors may enhance the quality of monitoring and promote CSR (Fernández-Gago et al., 2018). Then, a large presence of independent directors on a corporate board will encourage more CSR disclosure (Holtz and Sarlo Neto, 2014).

Financial performance (F_PERF) was also controlled for through the ROA ratio. Indeed, profitable firms have more resources to engage in CSR activities and disclosures (Amran and Devi, 2008).

We control for firm size (F_SIZE) because larger firms are more likely exposed to public pressure and media attention. Then, they are more likely to implement CSR policies and disclose activities showing their responsible behavior (Dhaliwal et al., 2014; Ting, 2020). Moreover, these big firms have more financial resources to engage in CSR activities and disclosures. Firm size is calculated using the natural logarithm of total market capitalization.

Leverage (F_LEV) was controlled for by the total debt to equity ratio. Highly indebted companies may also be more likely to engage in CSR disclosure in an attempt to satisfy the expectations and curiosity of their creditors by showing some degree of transparency (Khan et al., 2013; Roberts, 1992).

We also added an indicator variable for companies operating in highly polluting industries (IND_SEN) because some industries may have different impacts on CSP and CSR disclosure (Lucato et al., 2017), and because of the strong institutional pressure facing highly polluting firms to reduce their harmful impact on the environment, According to Wang et al. (2021), these industries mainly operate in mining, metal extraction, construction, water production and distribution, oil and coal gas, electric power, paper making and printing, chemicals and plastics, medicines and biologics, textiles and food and beverages. The generated variable is a dummy variable that takes 1 if the company belongs to an environmentally sensitive industry and 0 otherwise.

Firm age (F_AGE) was also added to the research model because older firms tend to have more resources available to contribute to CSR activities than young firms that lack this formalization altogether. Moreover, the former has an experience with the surrounding environment and are expected to act as socially responsible in the community by disclosing more CSR information (Badulescu et al., 2018).

Table 3 presents summary definitions of all variables employed.

Table 3 Variables description

Variables	Descriptions
Dependent variables	
SG_DS	Aggregate CSR disclosure is equal to the average social disclosure score and governance disclosure score
SOC_DS	The social disclosure score
GOV_DS	The corporate governance disclosure score
Independent variable	
CEO_NAR	Narcissism composite measure of CEO narcissism resulting from a factor analysis using the CEO photograph size, relative cash pay, and relative non-cash pay
Moderating variables	
CEO_DUAL	A dummy variable that takes 1 if the CEO occupies the chair position of the board of directors and 0 otherwise
B_GEN	The proportion of female directors within the board
Control variables	
CEO_AGE	The age of the CEO in years
CEO_GEN	The gender variable is a dummy variable that takes 1 if the CEO is female and 0 otherwise
B_SIZE	The total number of directors ionthe board
B_IND	The proportion of independent directors ionthe board
F_PERF	RThe ratioof net income to total asset
F_SIZE	The natural logarithm of total market capitalization
F_LEV	Ratio of the total debt to equity ratio
IND_SEN	A dummy variable that takes 1 if the company belongs to an environmentally sensitive industry (mining, metal extraction, construction, water production and distribution, oil and coal gas, electric power, paper making and printing, chemicals and plastics, medicines and biology, textiles and food and beverages) and 0 otherwise
F_AGE	Age of the firm

3.3 Econometric models

A hierarchical regression analysis was used according to a moderation analysis procedure. First, in Model (1) we introduce the control variables. In Model (2), the main independent variable (CEO narcissism) was introduced together with the control variables along with year dummies. Next, we include CEO narcissism in the regression analysis along with the moderating variables and the control variables. More specifically, we use CEO duality and board gender diversity in models (3a) and (3b) respectively. In Models (4a) and (4b), we investigate the impact of the interaction between CEO narcissism and the moderating variables (respectively CEO duality and board gender diversity) on the different CSR disclosure scores in the presence of control variables. Finally, we run model (5) including the control variables, the main independent variable, the two moderating variables, and the two interaction variables.

Table 4 Descriptive statistics

	Mean	SD	Min	Max
SG_DS	0.432	0.109	0.124	0.726
GOV_DS	0.579	0.085	0.196	0.768
SOC_DS	0.285	0.16	0.035	0.684
CEO_NAR	− 0.0012	0.5218	− 0.9984	2.851
CEO_DUAL	0.589	0.492	0	1
CEO_AGE	61.242	5.74	38	84
CEO_GEN	0.045	0.206	0	1
B_SIZE	5.582	0.909	1	13
B_IND	0.716	0.131	0	1
B_GEN	0.102	0.129	0	0.6
F_PERF	7.778	6.615	− 12.12	30.34
F_SIZE	16.761	1.076	11.673	20.989
F_LEV	0.639	0.205	0.138	1.216
IND_SEN	0.382	0.486	0	1
F_AGE	81.03	55.64	8	224

$$\begin{aligned} CSR\_SCORES_{it} =& CEO\_NAR_{it} + Moderating\ variables_{it} \\ &+ CEO\_NAR_{it} \times Moderating\ variables_{it} \\ &+ CSR\_SCORES_{it-1} + Control\ variables + year + \varepsilon_{it} \end{aligned} \quad (1)$$

All continuous variables have been winsorized at the 1% and 99% levels to mitigate the impact of outliers. In all the regression, we controlled for year fixed-effects to avoid any common trend in the CSR disclosure score over time.

The endogeneity issue is a serious concern that could bias the OLS estimate coefficients (Ben Rejeb et al., 2018). The endogeneity arises from the omitted variables that affect differently CSR disclosure. Furthermore, it could be due to the reverse causality (i.e., CSR disclosure can affect CEO power), as firms with higher levels of CSR disclosure may attract highly narcissistic CEOs because of the visibility of these firms. Therefore, the one-period lagged values of the dependent variables were included in the models to control for unobservable firm-specific effects.

We estimate these models using the generalized method of moments (GMM) developed by Arellano and Bover (1995) and Blundell and Bond (1998). This technique is a dynamic linear model that tests relationships between CSR disclosure and CEO narcissism, which hedges endogeneities, simultaneities, and firm-specific heterogeneities in our main regressions. Moreover, some of the independent variables, such as firm size, leverage, and board corporate governance mechanisms, can suffer from cross-causality with the dependent variable (Lassoued and Ben Osman, 2021). Therefore, these regressors are instrumented with appropriate lagged values.

Table 5 Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) SG_DS	1.000																
(2) GOV_DS	0.901*	1.000															
	(0.000)																
(3) SOC_DS	0.807*	0.585*	1.000														
	(0.000)	(0.000)															
(4) CEO_NAR	0.213*	0.196*	0.182*	1.000													
	(0.000)	(0.000)	(0.000)														
(5) CEO_DUAL	0.141*	0.132*	0.122*	0.186*	1.000												
	(0.000)	(0.000)	(0.000)	(0.000)													
(6) B_GEN	0.206*	0.202*	0.133*	0.053*	0.021	1.000											
	(0.000)	(0.000)	(0.000)	(0.005)	(0.231)												
(7) CEO_DUAL × CEO_NAR	0.164*	0.164*	0.111*	0.798*	0.102*	0.000	1.000										
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.992)											
(8) B_GEN × CEO_NAR	0.173*	0.177*	0.109*	0.611*	0.085*	0.082*	0.499*	1.000									
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)										
(9) CEO_AGE	−0.015	−0.032	0.024	0.003	0.238*	−0.063*	−0.043*	0.039*	1.000								
	(0.420)	(0.085)	(0.199)	(0.870)	(0.000)	(0.000)	(0.022)	(0.038)									
(10) CEO_GEN	0.124*	0.122*	0.093*	0.082*	0.021	0.288*	0.094*	0.161*	−0.035*	1.000							
	(0.000)	(0.000)	(0.000)	(0.000)	(0.226)	(0.000)	(0.000)	(0.000)	(0.039)								
(11) B_SIZE	0.042*	0.054*	0.008	0.022	−0.007	0.053*	−0.015	0.014	0.003	0.013	1.000						
	(0.015)	(0.002)	(0.645)	(0.232)	(0.667)	(0.001)	(0.415)	(0.459)	(0.874)	(0.396)							
(12) B_INDEP	0.096*	0.108*	0.045*	0.245*	0.051*	0.096*	0.174*	0.097*	−0.177*	0.011	0.135*	1.000					
	(0.000)	(0.000)	(0.010)	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.489)	(0.000)						
(13) F_PERF	−0.039*	−0.019	−0.059*	−0.001	−0.067*	0.003	0.016	−0.016	−0.056*	−0.015	−0.037*	−0.014	1.000				

Table 5 (continued)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	(0.024)	(0.285)	(0.001)	(0.978)	(0.000)	(0.838)	(0.411)	(0.405)	(0.001)	(0.343)	(0.021)	(0.389)					
(14) F_SIZE	0.331*	0.263*	0.383*	0.083*	0.220*	0.084*	0.056*	0.020	0.111*	0.086*	0.059*	0.048*	−0.348*	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.282)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)				
(15) F_LEV	0.108*	0.095*	0.103*	0.082*	0.110*	0.091*	0.054*	0.028	0.036*	0.063*	0.040*	0.065*	−0.189*	0.350*	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.131)	(0.037)	(0.000)	(0.012)	(0.000)	(0.000)	(0.000)			
(16) IND_SEN	0.233*	0.221*	0.184*	0.096*	0.030	0.040*	0.067*	0.070*	−0.029	0.046*	0.056*	0.070*	0.020	−0.028	−0.124*	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.080)	(0.012)	(0.000)	(0.000)	(0.089)	(0.003)	(0.000)	(0.000)	(0.221)	(0.076)	(0.000)		
(17) F_AGE	0.336*	0.313*	0.301*	0.151*	0.216*	0.059*	0.128*	0.099*	0.091*	0.043*	0.049*	0.017	−0.040*	0.216*	0.052*	0.100*	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.002)	(0.285)	(0.014)	(0.000)	(0.001)	(0.000)	

* Statistical significance at the 5% level

Table 6 Analyses of the variance inflation factors (VIFs)

Variable	(1)	(2)	(3)
CEO_NAR	3.57	3.56	3.60
CEO_DUAL	1.18	1.19	1.19
B_GEN	1.15	1.15	1.13
CEO_DUAL×*CEO_NAR*	2.92	2.92	2.90
B_GEN×*CEO_NAR*	1.64	1.65	1.64
CEO_AGE	1.17	1.17	1.19
CEO_GEN	1.15	1.15	1.15
B_SIZE	1.14	1.14	1.14
B_INDEP	1.03	1.03	1.04
F_PERF	1.26	1.25	1.25
F_SIZE	1.56	1.51	1.64
F_LEV	1.21	1.21	1.22
IND_SEN	1.16	1.15	1.14
F_AGE	1.18	1.18	1.15
SG_DS_{t-1}	1.38		
SOC_DS_{t-1}		1.29	
GOV_DS_{t-1}			1.32
Mean VIF	1.51	1.50	1.51

4 Empirical findings

4.1 Descriptive statistics

Table 4 presents the summary statistics for all variables. As can be seen, the means of CSR scores are 0.432 for SG_DS, 0.285 for SOC_DS, and 0.579 for GOV_DS, suggesting that CSR disclosure highly focuses on corporate governance.

The narcissism score mean is below 0 which is close to the mean reported by Al-Shammari et al. (2019) (−0.). Narcissism ranges over values going from −0.9984 to 2.8519 with a standard deviation of 0.5218.

Table 5 reports the correlation matrix of the variables used in the regression. As shown, CEO narcissism correlates positively with voluntary CSR disclosure, which is consistent with our hypotheses. Furthermore, there is a strong correlation between SG_DS, SOC_DS, and GOV_DS, therefore we estimate each dimension separately.

Although some variables were significantly correlated, we check the multicollinearity effects of the variables used in the model by examining the variance inflation factor (VIF) (Ben Rejeb et al, 2019). Table 6 displays VIF for each model separately (given that the lagged value of SG, SOC, and GOV scores are included separately). VIFs indicate no evidence of multicollinearity because no VIF was higher than 10 in all models (Anderson et al., 1993; Kleinbaum et al., 1998; Cabeza-García et al., 2018; Ben Rejeb et al., 2013).

Table 7 Hierarchical regression analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: The independent variable *SG_DS*							
CEO_NAR		0.066	0.061	0.059	0.071	0.063	0.066
		(3.29)***	(3.35)***	(3.27)***	(3.37)***	(3.26)***	(3.40)***
CEO_DUAL			−0.077		−0.074		−0.132
			(−1.70)*		(−1.97)**		(−4.91)***
B_GEN				0.084		0.032	0.088
				(3.16)***		(3.38)***	(2.78)***
CEO_DUAL×CEO_NAR					0.054		0.03
					(2.20)**		(2.49)***
B_GEN×CEO_NAR						0.055	0.078
						(2.28**)	(2.01)**
CEO_AGE	−0.009	−0.005	−0.005	−0.005	−0.005	−0.005	−0.011
	(−2.52)**	(−1.85)*	(−1.99)**	(−1.69)*	(−1.98)**	(−1.73)*	(−3.12)***
CEO_GEN	−0.221	−0.049	−0.112	−0.044	0.113	−0.027	−0.124
	(−1.51)	(−0.38)	(−0.90)	(−0.33)	(−0.92)	(−0.21)	(−1.07)
B_SIZE	−0.013	−0.228	−0.158	−0.218	−0.159	−0.194	−0.02
	(−1.86)*	(−2.42)**	(−1.63)	(−2.23)**	(−1.65)*	(−1.98)**	(−2.83)***
B_IND	0.055	−0.002	−0.004	−0.005	−0.003	−0.006	0.014
	(0.52)	(−0.30)	(−0.49)	(−0.65)	(−0.46)	(−0.75)	(0.14)
F_PERF	0.002	0.001	0.001	0.001	0.001	0.001	0.001
	(1.99)**	(1.95)*	(1.68)*	(1.71)*	(1.69)*	(1.81)*	(1.24)
F_SIZE	0.124	0.024	0.039	0.024	0.04	0.026	0.104
	(2.83)***	(3.17)***	(2.18)**	(2.13)**	(1.79)*	(2.26)**	(4.08)***
F_LEV	−0.175	−0.036	−0.103	−0.057	−0.107	−0.052	−0.245
	(−2.72)***	(−2.45)**	(−2.28)**	(−1.66)*	(−2.30)**	(−0.62)	(−3.21)***
IND_SEN	−0.775	0.613	0.507	0.744	0.49	0.708	0.054
	(−1.44)	(1.22)	(1.06)	(1.40)	(1.01)	(1.36)	(0.11)
F_AGE	0.001	0.002	0.002	0.002	0.002	0.002	0.001
	(1.00)	(2.22)**	(2.11)**	(1.96)*	(2.12)**	(1.65)*	(0.04)
SG_DS_{t-1}	0.592	0.657	0.573	0.632	0.57	0.606	0.492
	(5.12)***	(6.85)***	(5.22)***	(6.23)***	(5.17)***	(5.98)***	(4.50)***
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1772	1772	1772	1772	1772	1772	1772
N	322	322	322	322	322	322	322
AR(1) (*P*-value)	0.821	0.456	0.421	0.256	0.174	0.223	0.373
AR(2) (*P*-value)	0.147	0.326	0.307	0.733	0.460	0.677	0.243
Hansen test (*P*-value)	0.507	0.607	0.563	0.747	0.502	0.719	0.254
Sargan test (*P*-value)	0.643	0.207	0.119	0.241	0.120	0.140	0.222
Panel B: The independent variable *SOC_DS*							
CEO_NAR		0.036	0.012	0.011	0.081	0.051	0.081
		(2.43)**	(2.43)**	(2.41)**	(2.47)**	(2.41)**	(2.87)***

Table 7 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CEO_DUAL			−0.174		−0.061		−0.222
			(−2.53)**		(−2.20)**		(−4.17)***
B_GEN				0.185		0.111	0.129
				(3.84)***		(2.00)**	(2.69)***
CEO_DUAL × CEO_NAR					0.087		0.027
					(2.71)***		(2.85)***
B_GEN × CEO_NAR						0.159	0.165
						(3.02)***	(1.70)*
CEO_AGE	−0.014	−0.007	−0.007	−0.006	−0.007	−0.006	−0.014
	(−2.08)**	(−1.84)*	(−1.83)*	(−1.67)*	(−1.89)*	(−1.69)*	(−3.30)***
CEO_GEN	−0.433	−0.251	−0.377	−0.242	−0.381	−0.224	−0.303
	(−1.77)*	(−1.37)	(−1.99)**	(−1.30)	(−2.01)**	(−1.22)	(−1.62)
B_SIZE	−0.022	−0.193	−0.08	−0.176	−0.086	−0.151	−0.031
	(−1.86)*	(−1.46)	(−0.54)	(−1.30)	(−0.58)	(−1.12)	(−2.80)***
B_IND	0.062	0.002	−0.003	−0.005	−0.002	−0.005	0.071
	(0.36)	(0.21)	(−0.28)	(−0.41)	(−0.20)	(−0.49)	(0.47)
F_PERF	0.002	0.001	0.002	0.002	.002	0	0.001
	(1.20)	(1.53)	(0.30)	(0.21)	(0.23)	(0.28)	(0.78)
F_SIZE	0.183	0.059	0.09	0.059	0.092	0.062	0.158
	(2.04)**	(1.99)**	(2.68)***	(1.96)**	(2.73)***	(2.07)**	(5.83)***
F_LEV	−0.237	−0.169	−0.273	−0.211	−0.287	−0.204	−0.377
	(−2.18)**	(−1.88)*	(−1.74)*	(−1.78)*	(−2.30)**	(−1.75)*	(−3.05)***
IND_SEN	−1.596	0.259	−0.213	0.529	−0.274	0.479	−0.344
	(−1.02)	(0.36)	(−0.29)	(0.71)	(−0.37)	(0.66)	(−0.46)
F_AGE	0.002	0.003	0.003	0.003	0.003	0.002	0.001
	(1.25)	(2.29)**	(1.94)*	(1.97)**	(1.94)*	(1.73)*	(0.30)
SOC_DS_{t-1}	0.555	0.614	0.494	0.576	0.491	0.558	0.465
	(4.55)***	(6.04)***	(4.23)***	(5.48)***	(4.20)***	(5.29)***	(4.07)***
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1772	1772	1772	1772	1772	1772	1772
N	322	322	322	322	322	322	322
AR(1) (*P*-value)		0.717	0.168	0.365	0.181	0.123	0.160
AR(2) (*P*-value)	0.429	0.232	0.625	0.401	0.621	0.341	0.777
Hansen test (*P*-value)	0.891	0.267	0.675	0.404	0.649	0.363	0.805
Sargan test (*P*-value)	0.945	0.250	0.173	0.288	0.188	0.191	0.176
Panel C: The independent variable *GOV_DS*							
CEO_NAR		0.011	0.014	0.011	0.051	0.019	0.045
		(2.16)**	(2.69)***	(2.53)**	(2.23)**	(2.04)**	(1.99)**
CEO_DUAL			−0.032		−0.027		−0.042
			(−1.66)*		(−0.52)		(−3.65)***
B_GEN				0.023		0.041	0.08

Table 7 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				(0.30)		(0.53)	(1.93)*
CEO_DUAL×CEO_NAR					0.021		0.029
					(1.86)*		(1.60)
B_GEN×CEO_NAR						0.068	0.056
						(1.50)	(1.60)
CEO_AGE	−0.006	−0.006	−0.007	−0.006	−0.007	−0.005	−0.007
	(−2.34)***	(−2.07)**	(−2.38)**	(−1.94)*	(−2.41)**	(−1.87)*	(−1.11)
CEO_GEN	−0.027	0.153	0.14	0.155	0.137	0.184	0.067
	(−0.28)	(1.08)	(0.99)	(1.07)	(0.98)	(1.27)	(0.65)
B_SIZE	−0.007	−0.218	−0.231	−0.215	−0.231	−0.185	−0.011
	(−1.54)	(−1.94)*	(−1.90)*	(−1.87)*	(−1.92)*	(−1.59)	(−1.73)*
B_IND	−0.06	−0.004	−0.007	−0.005	−0.007	−0.006	−0.082
	(−0.82)	(−0.53)	(−0.84)	(−0.58)	(−0.80)	(−0.74)	(−0.90)
F_PERF	0.002	0.001	0.002	0.001	0.002	0.002	0.002
	(3.83)***	(1.63)*	(1.47)	(1.42)	(1.79)*	(1.77)**	(2.27)**
F_SIZE	0.073	0.011	0.02	0.009	0.021	0.01	0.049
	(2.74)***	(3.56)***	(3.94)***	(3.49)***	(1.99)**	(3.54)***	(3.40)***
F_LEV	−0.085	0.011	0.011	0.009	0.007	0.025	−0.072
	(−2.51)**	(0.17)	(0.16)	(0.13)	(0.10)	(0.36)	(−1.44)
IND_SEN	0.355	1.083	1.121	1.129	1.095	1.087	0.722
	(0.99)	(1.89)*	(1.19)	(1.87)*	(1.94)*	(1.82)*	(1.64)
F_AGE	0	0.001	0.001	0.001	0.001	0.001	−0.001
	(−0.39)	(1.07)	(0.77)	(1.02)	(0.76)	(0.56)	(−0.63)
GOV_DS_{t-1}	0.317	0.388	0.277	0.382	0.269	0.365	0.299
	(4.54)***	(3.66)***	(2.19)**	(3.49)***	(2.08)**	(3.35)***	(3.30)***
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1809	1809	1809	1809	1809	1809	1809
N	322	322	322	322	322	322	322
AR(1) (*P*-value)	0.962	0.238	0.401	0.213	0.323	0.236	0.594
AR(2) (*P*-value)	0.661	0.659	0.901	0.591	0.903	0.646	0.541
Hansen test (*P*-value)	0.302	0.997	0.999	0.997	0.997	0.999	0.532
Sargan test (*P*-value)	0.174	0.341	0.457	0.385	0.404	0.237	0.383

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

4.2 Main results

Table 7 presents the empirical results of the baseline regressions. In all columns, the Sargan test is statistically insignificant indicating that the excluded instruments do not correlate with an error term and confirms the assumption of the validity of

instruments. The *p*-value of the Hansen test does not reject the null hypothesis that the over-identifying restrictions are valid. The AR (1) and AR (2) test investigate the null hypothesis of zero autocorrelation in the first-difference errors. Moreover, the lagged values of the dependent variables are strongly significant and positive in all models, highlighting that all are persistent across the years, and justifying the use of the GMM technique.

Results are presented in three panels. Panel A, B, and C report respectively the results of SG_DS, SOC_DS, and GOV_DS regressions.

The first columns in each panel display the effect of the control variables on CSR disclosure scores. As expected, CEO_AGE and B_SIZE exhibit a negative significant effect in most regressions while F_PERF and F_SIZE have positive significant effects on voluntary CSR disclosure. However, contrary to our expectation, the coefficient of F_LEV is negative and significant in most regressions.

Column 2 in Panel A, displays the main models testing the effect of narcissism on SG_DS. As shown, a positive significant coefficient ($\beta = 0.066$, $p < 0.01$) suggests a positive relationship between CEO narcissism and the aggregate voluntary CSR disclosure score supporting, thereby, the 1st hypothesis H1. Indeed, the motivational element of the narcissistic dimension denotes a continuous search for the assertion of an already inflated egocentric view of oneself (Fatfouta, 2019). Then, given the growing stakeholder interest and media focus on CSR disclosure, it represents the perfect opportunity for a highly narcissistic CEO to get admiration and applause. This CEO, therefore, incites the firm into engaging in CSR disclosure (Ahn et al., 2020; Al-Shammari et al., 2019; Petrenko et al., 2016).

In column 2 (Panel B), the coefficient for narcissism is positive and significant ($\beta = 0.036$, $p < 0.05$) supporting hypothesis H1a. The relationship between CEO narcissism and disclosure of social-related CSR activities is positive, as expected. Indeed, as these activities deal with socially sensitive subjects and receive attention from a larger audience, they give CEOs better visibility and portray them as protagonists and noble saviors. Highly narcissistic CEOs, who are always desperate to be the heroes of the day, will not miss this opportunity (Gerstner et al., 2013). As shown by Al-Shammari et al. (2019), these CEOs will engage more in social-related CSR activities and their disclosure levels will increase as a result.

Furthermore, the effect of CEO narcissism on the governance disclosure score is positive and significant as shown in column 2 (Panel C), ($\beta = 0.011$, $p < 0.05$), which is consistent with Hypothesis (H1b) suggesting a positive effect of narcissism on governance disclosure. Indeed, more narcissistic CEO tend to disclose information that serves the image of accountability and ethical behavior. This is why they tend to disclose information that shows respect for shareholder rights. However, the results may be considered inconsistent with those of Al-Shammari et al. (2019), who found a negative relationship between narcissism and CSR performance. They argue that firms managed by highly narcissistic CEOs are poorly governed because these latter are arrogant and work in negative atmospheres. One plausible explanation for these divergent findings is the possible presence of selective disclosure induced by narcissism in our sample. Certainly, narcissism has been linked to tax shelters (Olsen and Stekelberg, 2016) and fraud (Amernic

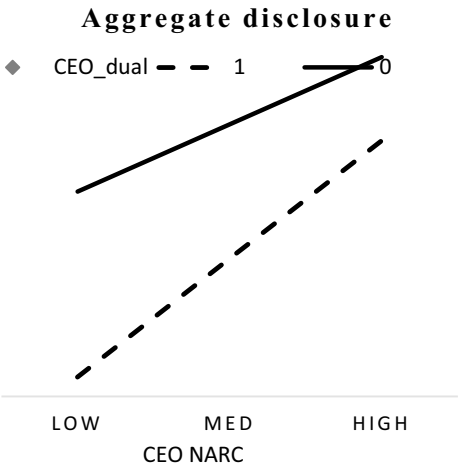

Fig. 1 Moderating effects of CEO duality on the relationship between SG disclosure and CEO narcissism

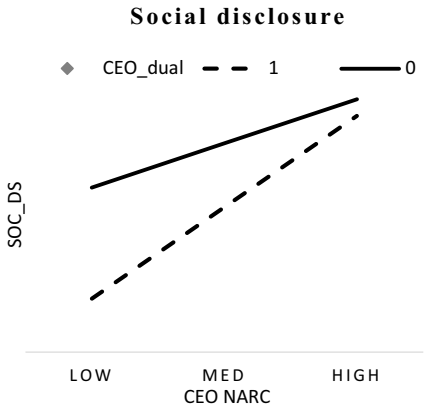

Fig. 2 Moderating effects of CEO duality on the relationship between social disclosure and CEO narcissism

and Craig, 2010). This attests to the ability of highly narcissistic CEOs to undertake this type of abuse, especially in a competitive environment that encourages them to mirror the image of the ultimate leaders in all its dimensions. Theoretically, our finding supports the view of upper echelons theory (Hambrick and Mason, 1984; Hambrick, 2007) indicating that CEO-specific attributes determine corporate policies and goals.

In column 3 of Panel A, it is observed that the variable CEO_DUAL hurts CSR disclosure, showing that duality leads to CEO dominance, which fosters managerial entrenchment and diminishes reporting transparency, like discouraging CSR disclosure. This finding corroborates the results of Rashid et al. (2020) and Chau and Gray (2010).

For board gender diversity, the coefficient is positive but the significant effect is reported only on SG_DS (Column 4 of Panel A) and SOC_DS (Column 4 of Panel B). The coefficient of GOV_DS is not significant (Column 4 of Panel C), indicating

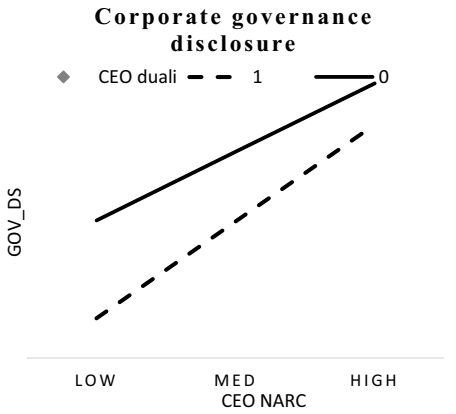

Fig. 3 Moderating effects of CEO duality on the relationship between corporate governance disclosure and CEO narcissism

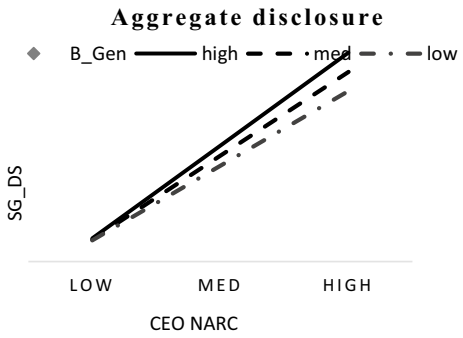

Fig. 4 Moderating effects of board gender diversity on the relationship between SG disclosure and CEO narcissism

that board gender diversity increases particularly the aggregated dimensions of CSR disclosure and social disclosure but not corporate governance disclosure. This finding may be explained by the assumption that women better internalize ethical practices than men, (Eagly et al., 2012; Eagly and Wood, 2016; Franke, 1997). They seem more focused on social and charity activities than corporate governance disclosure (Williams, 2003).

We now examine the moderating role of CEO duality in the relationship between CEO narcissism and voluntary CSR disclosure. The coefficient of the interaction variable (CEO_NARC×CEO_DUAL) is positive and significant, as expected in SG_DS regression (Column 5 of Panel A), SOC_DS regression (Column 5 of Panel B), and GOV_DS regression (Column 5 of Panel C). Indeed, these findings support hypotheses H2, H2a, and H2b and indicate that CEO duality strengthens the effect of CEO narcissism on CSR disclosure. Thus, CEO duality moderates the relationship between CEO narcissism and CSR disclosure. These findings show that when more narcissistic CEOs are also the chairman, they will have more freedom and will engage more in CSR disclosure to reinforce their impressive self-image (Horvath and Morf, 2010) and satisfy their concern with fantasies of unlimited success or power, and beliefs of being special. This also provides empirical support for the

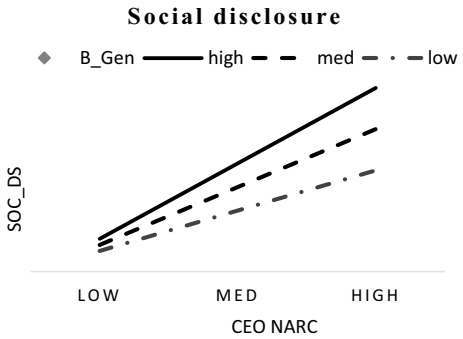

Fig. 5 Moderating effects of board gender diversity on the relationship between social disclosure and CEO narcissism

predictions of agency theory indicating that CEOs become powerful because they hold the dual roles of CEO and chairman (Morck et al., 1988). Furthermore, the upper echelon theory is also validated by showing the role of CEO attributes in conditioning firm performance.

To better visualize the significant interaction, the relationship between the two variables (CEO_NARC and CEO_DUAL) is plotted at high and low levels using Modgraph (Jose, 2013).[5] These graphs show two regression lines for CSR disclosure based on CEO narcissism corresponding to two values determined for CEO duality (1 or 0). In Figs. 1, 2 and 3, the positive slope of CEO narcissism–CSR disclosure is much steeper for CEOs who hold chairman positions than other CEOs for the three CSR disclosure scores. These results support H2, H2a, and H2b.

For the moderating effect of board gender diversity, the interaction variables (CEO_NARC × B_GEN) in Columns 6, (of Panel A and Panel B) show a positive and significant coefficient, as suggested in hypotheses H3 and H3a, suggesting that board gender diversity moderates the relationship between voluntary CSR disclosure and CEO narcissism and between this latter and social disclosure.

A moderation graph is used to illustrate the moderation effects of board gender diversity. We report in Figs. 4 and 5 the significant interaction obtained in respectively SG_DS and SOC_DS regressions. The interaction effect reveals an enhancing effect that as board gender diversity and CEO narcissism increase aggregate and social disclosures also increase as indicated by the steepness of the slopes. Accordingly, the relationship between CEO narcissism and CSR disclosure is stronger when the female proportion on the board of directors is higher.

Finally, the last column, in three panels, displays the results of the entire model including the control variables, the main independent variable, the 2 moderating variables, and the two interaction variables. As shown, the results did not vary.

[5] We thank the reviewer for suggesting to add these graphs.

Table 8 Regression results of CEO narcissism and relative CSR disclosure

	SOC_DS/GOV_DS (1)	SOC_DS/GOV_DS (2)	SOC_DS/GOV_DS (3)
CEO_NAR	0.056	0.063	0.05
	(2.42)**	(2.85)***	(2.09)***
CEO_DUAL		−0.339	
		(−0.89)	
B_GEN			0.26**
			(1.97)
CEO_DUAL × CEO_NAR		0.008	
		(0.15)	
B_GEN × CEO_NAR			0.135
			(3.26)***
CEO_AGE	−0.013	−0.013	−0.012
	(−2.23)**	(−2.22)**	(−2.05)**
CEO_GEN	−0.777	−0.779	−0.736
	(−2.35)**	(−2.35)**	(−2.21)**
B_SIZE	−0.049	−0.04	−0.046
	(−2.14)**	(−2.08)**	(−2.25)**
B_IND	0.29	0.292	0.334
	(1.58)	(1.59)	(1.79)*
F_PERF	0.001	0.001	0.001
	(0.48)	(0.45)	(0.55)
F_SIZE	0.229	0.23	0.228
	(4.88)***	(4.86)***	(4.77)***
F_LEV	−0.513	−0.52	−0.511
	(−2.39)**	(−2.36)**	(−2.38)**
IND_SEN	−1.076	−1.12	−1.03
	(−0.84)	(−0.86)	(−0.80)
F_AGE	0.002	0.002	0.002
	0.95	(0.95)	(0.68)
$(SOC\_DS/GOV\_DS)_{t1}$	0.344	0.350	0.344
	(2.91)***	(2.99)***	(2.96)***
Years fixed effects	Yes	Yes	Yes
Observations	1771	1772	1770
N	322	322	322
AR(1) (*P*-value)	0.163	0.183	0.203
AR(2) (*P*-value)	0.127	0.155	0.137
Hansen test (*P*-value)	0.745	0.805	0.888
Sargan test (*P*-value)	0.967	0.949	0.966

* Statistical significance at the 10% level

** Statistical significance at the 5% level

*** Statistical significance at 1% level

4.3 Additional evidence: a relative measure of CSR disclosure

Unlike our findings, previous studies indicated that highly narcissistic CEOs tend to disclose externally oriented CSR activities (like social) than internal oriented activities (like corporate governance). Indeed, social disclosure deals with socially sensitive subjects and is generally more important than others for the general public. It gives CEOs better visibility while they portray them as protagonists and noble saviors (Petrenko et al., 2016; Al-Shammari et al., 2019). Highly narcissistic CEOs, who are always desperate to be the heroes of the day, will not miss this opportunity (Gerstner et al., 2013).

Bearing on this proposal, although it positively affects both types of disclosure, CEO narcissism can increase social disclosure more than governance disclosure (SOC_DS/GOV_DS). To check this thesis, we calculate a relative variable that divides disclosure of social-related activities by disclosure of governance-related activities. This variable would give an idea about CEO preferences for which disclosed CSR information.[6]

The results are reported in Table 8. As expected, the coefficient of CEO narcissism is positive and significant. Furthermore, the coefficient of the interaction variable CEO_NARC × CEO_DUAL is insignificant while that of CEO_NARC × B_GEN is positive and significant. These findings reveal that highly narcissistic CEOs tend to disclose more social information than corporate governance disclosure, especially in the presence of female directors on the board.

4.4 Robustness check

To ensure the robustness of the results, we perform several sensitivity tests.

4.4.1 Alternative econometric design

The use of a fixed independent variable (CEO_NAR) tends to increase the possibility of non-autonomous observations and the inefficiency of the model (Ballinger, 2004). In this case, many researchers recommend the use of the generalized estimating equations (GEE) technique (Chatterjee and Hambrick, 2007; Petrenko et al., 2016; Dabbebi et al., 2022). This technique aims at producing efficient and unbiased regression estimates for models with longitudinal or repeated measures and data with non-normal distributions (Ballinger, 2004).

For the GEE model, and following the recommendations of Ballinger (2004), the identity-link function is specified, which mimics a general linear model, with a normal (Gaussian) distribution. This choice was made because of the probable normal distribution of the independent variables. Then an unstructured correlation system to our model is specified which estimates all possible forms of correlations

[6] We thank the reviewer for suggesting to add this test.

Table 9 Regression results of CEO narcissism and CSR disclosure (GEE technique)

	SG_DS (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
CEO_NAR	0.012	0.015	0.004	0.007	0.006	0.005	0.008	0.007	0.002
	(2.86)***	(3.37)***	(3.25)***	(2.70)***	(2.76)***	(2.99)***	(2.46)**	(3.95)***	(2.17)**
CEO_DUAL				0.007	0.001	−0.003			
				(1.11)	(0.18)	(−0.85)			
B_GEN							0.004	0.005	0.008
							(3.02)***	(2.75)***	(1.77)*
CEO_DUAL × CEO_NAR				0.003	0.004	0.003			
				(2.17)**	(2.35)**	(2.13)**			
B_GEN × CEO_NAR							0.01	0.014	−0.015
							(3.31)***	(3.45)**	(−1.01)
CEO_AGE	−0.001	−0.002	−0.001	−0.002	−0.002	−0.001	−0.002	−0.002	−0.001
	(−3.42)***	(−4.35)	(−5.33) ***	(−4.59)***	(−4.36)***	(−5.31)***	(−4.62)***	(−4.40)***	(−5.41)***
CEO_GEN	−0.001	.019	−0.009	−0.006	.019	−0.008	−0.005	.019	−0.009
	(−0.20)	(1.21)	(−1.19)	(−0.47)	(1.19)	(−1.16)	(−0.47)	(1.19)	(−1.24)
B_SIZE	−0.001	−0.005	−0.001	−0.005	−0.005	−0.001	.063	.049	.034
	(−2.65)***	(−2.72)***	(−1.59)	(−3.07)***	(−2.70)***	(−1.62)	(4.37)***	(2.54)**	(3.78)***
B_IND	0.002	0.093	0.025	0.067	0.093	0.025	0.068	0.094	0.026
	(3.28)***	(4.26)***	(2.53) ***	(4.18)***	(4.28)***	(2.52)**	(4.23)***	(4.33)***	(2.63)***
F_PERF	0.001	0.002	0.001	0.001	0.002	0.001		0.002	0.001
	(1.66)*	(4.13)***	(1.67) ***	(2.19)**	(4.12)***	(1.67)*	(2.16)**	(4.09)***	(1.59)
F_SIZE	.003	0.031	0.02	0.039	0.036	0.02	0.037	0.036	0.019
	(5.16)***	(8.53)***	(9.53) ***	(10.96)***	(8.54)***	(9.53)***	(10.96)***	(8.56)***	(9.50)***
F_LEV	.01	0.047	−0.001	0.027	0.0452	−0.001	0.025	0.042	−0.003
	(2.17)**	(2.12)**	(−0.11)	(1.70)*	(2.12)***	(−0.12)	(1.58)	(1.97)**	(−0.28)
IND_SEN	.006	0.074	0.038	0.052	0.075	0.038	0.052	0.074	0.038

Table 9 (continued)

	SG_DS (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
	(3.28)***	(5.75)***	(5.59) ***	(4.59)***	(5.77)***	(5.56)***	(4.53)***	(5.72)***	(5.54)***
F_AGE	0.001	0.002	0.001		0.002	0.001		0.002	0.001
	(4.53)***	(6.00)***	(4.79) ***	(5.57)***	(6.00)***	(4.78)***	(5.58)***	(6.01)***	(4.80)***
SG_DS_{t-1}	0.895			0.489			0.501		
	(19.60)***			(19.13)***			(19.26)***		
SOC_DS_{t-1}		0.408			0.392			0.476	
		(20.13)***			(20.01)***			(21.12)***	
GOV_DS_{t-1}			0.482			0.481			0.871
			(27.85) ***			(27.92)***			(28.30)***
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1772	1772	1809	1772	1772	1809	1772	1772	1809
N	322	322	322	322	322	322	322	322	322

* Statistical significance at the 10% level

** Statistical significance at the 5% level

*** Statistical significance at 1% level

Table 10 Alternative variables measures

	SG_DS (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
CEO_NAR	0.065	0.038	0.008	0.065	0.043	0.008	0.079	0.038	0.007
	(3.49)***	(2.75)****	(2.37)**	(3.25)***	(2.84)***	(2.36)**	(3.45***)	(2.74)***	(2.35)**
CEO_COMM				−0.015	−0.031	−0.014			
				(−1.41)	(−2.76)***	(−1.71)*			
B_GEN							0.096	0.089	0.037
							(2.32)**	(1.88)*	(0.34)
CEO_COMM × CEO_NAR				0.002	0.027	0.021			
				(2.15)**	(1.83)*	(1.98)**			
B_GEN × CEO_NAR							0.049	0.062	0.079
							(3.14)***	(2.35)**	(1.71)
CEO_AGE	−0.006	−0.009	−0.005	−0.004	−0.01	−0.005	−0.006	−0.009	−0.005
	(−2.13)**	(−2.76)***	(−1.39)	(−3.34)***	(−2.80)***	(−1.37)	(−2.02)**	(−2.79)***	(−1.45)
CEO_GEN	0.124	0.101	0.185	0.117	0.079	0.185	0.112	0.133	0.232
	(1.17)	(0.90)	(1.62)	(0.52)	(0.65)	(1.60)	(0.08)	(1.17)	(2.01)**
B_SIZE	−0.001	−0.011	−0.005	−0.001	−0.014	−0.005	−0.002	−0.01	−0.005
	(−0.16)	(−1.40)	(−0.66)	(−0.12)	(−1.56)	(−0.65)	(−0.22)	(−1.28)	(−0.58)
B_IND	0.235	0.365	0.136	0.197	0.352	0.136	0.213	0.366	0.139
	(2.49)**	(4.85)***	(1.86)*	(2.94)***	(4.32)***	(1.86)*	(2.24)**	(4.88)***	(1.94)
MCVR	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.89)	(3.71)***	(1.03)	(0.69)	(3.46)***	(1.03)	(1.89)*	(3.82)***	(1.34)
LNASSET	0.056	0.067	0.01	.06	0.065	0.01	0	0.068	0.011
	(3.72***)	(5.98)***	(0.93)	(3.15)***	(5.32)***	(0.93)	0.054	(6.05)***	(1.02)
F_LEV	−0.103	0−.096	−0.102	−0.033	−0.103	−0.102	−0.034	−0.086	−0.086
	(−1.72)*	(−1.55)	(−1.66)*	(−2.53)**	(−1.53)	(−1.65)*	(−2.33)**	(−1.37)	(−1.42)
IND_PROFILE	0.73	0.377	1.326	0.863	0.688	1.329	0.754	0.274	1.21

Table 10 (continued)

	SG_DS (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
	(2.42)**	(0.78)	(2.63)***	(1.78)*	(1.25)	(2.49)**	(2.46)**	(0.56)	(2.42)**
F_AGE	0.002	0.001	00.001	0.001	0.001	0.001	0.002	0.001	0.001
	(2.02)**	(0.66)	(0.17)	(1.39)	(0.78)	(0.17)	(1.61)	(0.43)	(−0.19)
SG_DS_{t-1}	0.665			0.639			0.621		
	(7.34)***			(6.66)***			(6.61)***		
SOC_DS_{t-1}		0.364			0.383			0.363	
		(4.12)***			(3.99)***			(4.13)***	
GOV_DS_{t-1}			0.154			0.154			0.126
			(1.28)			(1.28)			(1.97)**
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1747	1712	1750	1747	1712	1750	1747	1712	1750
N	322	322	322	322	322	322	322	322	322
AR(1) (*P*-value)	0.325	0.300	0.692	0.564	0.312	0.641	0.325	0.203	0.630
AR(2) (*P*-value)	0.698	0.674	0.138	0.445	0.434	0.231	0.459	0.219	0.238
Hansen test (*P*-value)	0.768	0.755	0.534	0.852	0.401	0.642	0.778	0.476	0.632
Sargan test (*P*-value)	0.776	0.539	0.978	0.311	0.112	0.963	0.711	0.725	0.982

* Statistical significance at the 10% level

** Statistical significance at the 5% level

*** Statistical significance at 1% level

(exchangeable, independent, autoregressive, etc.) between the variables and includes them in the variance estimation.

The results of the GEE technique are reported in Table 9. The findings seem to converge with those of the basic model using the GMM estimation. The coefficients of (CEO_NAR) are positive and statistically significant at the 1% level in most models, indicating that more narcissistic CEOs intend more voluntary CSR disclosure. The coefficients of the interaction variable CEO_NARC × CEO_DUAL is positive and significant for the three measures of CSR disclosure, while those of CEO_NARC × B_GEN show positive and significant effects on SG _DS and SOC_DS. Our results from these models are similar to the main findings and indicate that our results are robust to the presence of any statistical problems that may arise from the use of static independent variables.

4.4.2 Alternative measures of variables

We include alternative measures of many variables in our basic models. To strengthen the measure of CEO power within the company, CEO duality is replaced by (CEO_COMM) which controls whether the CEO is a member of at least one committee (e.g. executive committee, risk committee.), a factor that increases their power (Khan et al., 2013). This variable takes 1 if the CEO is also a member of at least one committee and 0 otherwise.

Instead of calculating firm size using the natural logarithm of market capitalization, size is now calculated using the natural logarithm of total assets (LNASSET). The market capitalization variation (MCVR) ratio is used instead of ROA as a proxy of financial performance.

Instead of controlling for the sensitivity of the industry, in this analysis, industry profile IND_PROFILE is determined by distinguishing between high and low-profile industries. According to Roberts (1992), a high-profile industry is an industry with high visibility in the eyes of stakeholders, a high level of political risk, and/or intense concentrated competition. Not only does this type of industry been shown to positively affect CSR disclosure (Chan et al., 2014; Roberts, 1992), but it also represents an opportunity for more narcissistic CEOs to promote themselves. High-profile industries are those operating in mining, petroleum, chemicals, automotive and air transport, media and communication, tobacco and alcohol, tourism, papermaking, and agriculture (Hackston and Milne, 1996). This variable takes 1 if the company belongs to a high-profile industry and 0 otherwise.

As shown in Table 10, the estimation of all models shows a significant positive relationship between CEO narcissism and the dependent variables. Moreover, the coefficient of the interaction variables remains positive and significant which further supports the main results.

4.4.3 Alternative measures of narcissism index

Al-Shammari et al. (2019) recommended for future research to use data over longer periods to test whether CEO traits change over time. Therefore, we construct a

Table 11 Alternative narcissism measures

SG_DS1	*SG_DS* (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
Panel A: The dependent variable NARC_1									
NARC_1	0.016	0.066	0.015	0.038	0.056	0.008	0.102	0.078	0.017
	(2.21)**	(3.21)***	(2.53)**	(2.48)**	(2.36)**	(1.77)*	(2.19)**	(3.78)***	(2.51)**
CEO_DUAL				−0.092	−0.078	−0.035			
				(−2.25)**	(−0.98)	(−1.73)*			
B_GEN							0.127	0.147	0.034
							(2.45)**	(1.91)*	(1.01)
CEO_DUAL×NARC_1				0.006	0.012	0.011			
				(2.40)**	(2.40)**	(1.93)*			
B_GEN×NARC_1							0.096	0.163	0.046
							(3.42)***	(2.01)**	(1.91)*
CEO_AGE	−0.002	−0.017	−0.006	−0.003	−0.016	−0.007	−0.002	−0.015	−0.006
	(−4.01)***	(−4.67)***	(−4.29)***	(−4.14)***	(−4.71)***	(−4.24)***	(−3.00)***	(−4.46)***	(−3.98)***
CEO_GEN	−0.387	−0.433	−0.018	−0.333	−0.41	0.013	−0.038	−0.474	−0.025
	(−2.84)***	(−1.82)*	(−0.16)	(−2.31)**	(−1.67)*	(0.12)	(−3.34)***	(−2.01)**	(−0.23)
B_SIZE	−0.01	−0.026	−0.008	−0.011	−0.026	−0.008	−0.001	−0.026	−0.009
	(−1.70)*	(−2.20)**	(−1.63)	(−1.09)	(−2.19)**	(−1.52)	(−1.11)	(−2.20)**	(−1.61)
B_IND	0.205	0.155	0.062	0.052	0.158	0.064	0.113	0.219	0.078
	(1.33)	(1.22)	(1.17)	(0.58)	(1.25)	(1.18)	(1.18)	(1.71)*	(1.35)
F_PERF	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002
	(2.53)**	(1.00)	(3.44)***	(2.04)**	(0.87)	(3.08)***	(2.53)**	(0.75)	(3.07)***
F_SIZE	0.093	0.18	0.069	0.109	0.178	0.067	0.091	0.175	0.069
	(7.36)***	(5.85)***	(5.63)***	(7.61)***	(5.76)***	(5.27)***	(6.83)***	(5.83)***	(5.31)***

Table 11 (continued)

SG_DS1	*SG_DS* (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
F_LEV	−0.071	−0.234	−0.084	−0.092	−0.239	−0.088	−0.005	−0.219	−0.081
	(−1.15)	(−2.22)**	(−2.37)**	(−2,31)**	(−2.27)**	(−2.41)**	(−2.08)**	(−2.13)**	(−2.19)**
IND_SEN	−0.152	−1.067	0.518	−0.010	−1.044	0.564	0.009	−0.707	0.622
	(−0.32)	(−1.22)	(1.33)	(−1.03)	(−1.20)	(1.40)	−1.02	(−0.81)	(1.47)
F_AGE	0.022	0.001	−0.001	0.012	0.001	−0.001	−0.017	0.001	−0.001
	(0.45)	(0.17)	(−0.99)	(0.24)	(0.082)	(−1.12)	(−0.31)	(−0.05)	(−1.08)
SG_DS_{t-1}	0.291			0.254			0.247		
	(3.09)***			(2.71)***			(2.47)**		
SOC_DS_{t-1}		0.597			0.593			0.604	
		(5.02)***			(5.00)***			(5.19)***	
GOV_DS_{t-1}			0.342			0.331			0.325
			(4.58)***			(4.28)***			(4.05)***
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1214	1214	1221	1212	1212	1220	1215	1215	1220
N	302	302	302	302	302	302	302	302	302
AR(1) (*P*-value)	0.447	0.344	0.331	0.474	0.304	0.298	0.497	0.311	0.321
AR(2) (*P*-value)	0.198	0.632	0.581	0.564	0.582	0.599	0.345	0.209	0.691
Hansen test (*P*-value)	0.358	0.543	0.660	0.211	0.655	0.627	0.235	0.786	0.386
Sargan test (*P*-value)	0.561	0.508	0.912	0.673	0.503	0.991	0.356	0.657	0.642
Panel B: The dependent variable NARC_2									
NARC_2	0.32	0.013	0.013	0.25	0.007	0.001	0.016	0.027	0.011
	(2.80)***	(1.96)*	(2.14)**	(3.08)***	(2.30)**	(2.14)**	(2.67)***	(2.39)**	(2.23)**
CEO_DUAL				−0.016	−0.175	−0.049			
				(−0.40)	(−2.46)**	(−1.66)*			

Table 11 (continued)

SG_DS1	*SG_DS* (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
B_GEN							0.051	0.081	0.057
							(2.02)**	(1.69)*	(0.82)
CEO_DUAL×NARC_2				0.013	0.045	0.033			
				(2.95)***	(2.36)**	(1.82)*			
B_GEN×NARC_2							0.042	.177	.028
							(1.70)*	(2.15)**	(0.98)
CEO_AGE	−0.032	−0.014	−0.006	−0.003	−0.015	−0.006	−0.003	−0.013	−0.016
	(−4.57)***	(−4.36)***	(−4.11)***	(−4.37)***	(−4.42)***	(−4.13)***	(−4.17)***	(−3.72)***	(−4.08)***
CEO_GEN	−0.106	−0.361	−0.001	−0.153	−0.345	.014	−0.123	−0.485	−0.012
	(−1.27)	(−1.61)	(−0.01)	(−1.89)*	(−1.49)	(0.14)	(−2.46)**	(−1.99)**	(−0.11)
B_SIZE	−0.019	−0.025	−0.008	−0.009	−0.024	−0.007	−0.017	−0.026	−0.008
	(−3.54)***	(−2.27)**	(−1.59)	(−1.67)*	(−2.06)**	(−1.43)	(−2.95)***	(−2.18)**	(−1.62)
B_IND	−0.103	0.178	0.056	0.013	0.196	0.078	0.082	0.224	0.076
	(−1.32)	(1.50)	(1.29)	(0.17)	(1.59)	(1.41)	(1.02)	(1.77)*	(1.32)
F_PERF	0.002	0.001	0.002	0.002	0.001	0.002	0.002	0.001	0.002
	(3.92)***	(0.88)	(3.19)***	(2.01)**	(0.54)	(2.69)***	(2.03)**	(0.82)	(3.12)***
F_SIZE	0.072	0.169	0.066	0.091	0.162	0.063	0.074	0.171	0.067
	(4.72)***	(5.88)***	(5.25)***	(5.33)***	(5.43)***	(4.94)***	(4.89)***	(5.67)***	(5.23)***
F_LEV	−0.062	−0.249	−0.086	−0.026	−0.241	−0.084	−0.027	−0.219	−0.084
	(−1.93)*	(−2.54)**	(−2.36)**	(−1.66)*	(−2.38)**	(−2.31)**	(−1.73)*	(−2.11)**	(−2.27)**
IND_SEN	−0.021	−10.193	0.559	−0.201	−10.303	0.507	−0.098	−10.178	0.57
	(−0.66)	(−1.44)	(1.38)	(−1.21)	(−1.52)	(1.25)	(−1.06)	(−1.35)	(1.39)
F_AGE	0.012	0.001	−0.001	0.011	0.001	−0.001	−0.006	0.001	−0.001
	(1.29)	(0.91)	(−0.66)	(0.28)	(0.71)	(−0.80)	(−0.15)	(0.71)	(−0.73)

Table 11 (continued)

SG_DS1	*SG_DS* (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
SG_DS_{t-1}	0.417			0.379			0.413		
	(4.83)***			(4.49)***			(4.83)***		
SOC_DS_{t-1}		0.556			0.544			0.536	
		(4.96)***			(4.75)***			(4.88)***	
GOV_DS_{t-1}			0.322			0.317			0.313
			(4.26)***			(4.21)***			(4.18)***
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1049	1052	1049	1049	1052	1049	1049	1052	1049
N	273	273	273	273	273	273	273	273	273
AR(1) (*P*-value)	0.670	0.239	0.212	0.270	0.238	0.223	0.242	0.206	0.250
AR(2) (*P*-value)	0.104	0.973	0.181	0.849	0.878	0.199	0.717	0.526	0.303
Hansen test (*P*-value)	0.780	0.925	0.725	0.820	0.956	0.634	0.887	0.369	0.625
Sargan test (*P*-value)	0.618	0.766	0.305	0.147	0.749	0.277	0.152	0.752	0.566
Panel C: The dependent variable NARC_3									
NARC_3	0.029	0.030	0.018	0.033	0.003	0.012	0.029	0.028	0.016
	(2.99)***	(2.36)**	(2.37)**	(1.90)*	(2.10)**	(2.24)**	− 2.04	(2.46)**	(2.36)**
CEO_DUAL				− 0.027	− 0.189	− 0.055			
				(− 0.82)	(− 2.52)**	(− 1.79)*			
B_GEN							0.13	0.089	0.062
							(1.88)*	(1.77)*	(0.77)
CEO_DUAL × NARC_3				0.017	0.038	0.026			
				(2.55)**	(1.94)*	(2.17)**			

Table 11 (continued)

SG_DS1	*SG_DS* (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
B_GEN×NARC_3							0.034	0.135	0.029
							(2.38)**	(2.29)**	(0.71)
CEO_AGE	−0.003	−0.015	−0.006	−0.003	−0.014	−0.006	−0.003	−0.013	−0.006
	(−4.46)***	(−4.24)***	(−4.14)***	(−4.10)***	(−4.17)***	(−4.20)***	(−4.37)***	(−3.69)***	(−3.85)***
CEO_GEN	−0.01	−0.384	−0.011	−0.044	−0.406	−0.014	−0.01	−0.434	−0.020
	(−2.14***)	(−1.61)	(−0.12)	(−2.22)**	(−1.67)*	(−0.16)	(−3.15)***	(−1.87)*	(−0.22)
B_SIZE	−0.024	−0.027	−0.009	−0.019 implePara>	−0.025	−0.008	−0.02	−0.028	−0.01
	(−4.67)***	(−2.26)**	(−1.83)*	(−3.54)***	(−2.04)**	(−1.53)	(−3.77)***	(−2.37)**	(−1.86)*
B_IND	0.069	0.127	0.044	−0.028	0.124	0.045	−0.06	0.181	0.055
	(0.94)	(0.96)	(0.79)	(−0.37)	(0.93)	(0.84	(−0.84)	(1.35)	(0.94)
F_PERF	0.001	0.001	0.002	0.001	0.001	0.002	0.001	0.001	0.002
	(2.55)***	(0.64)	(3.32)***	(2.19)	(0.54)	(3.01)***	(2.37)**	(0.74)	(3.27)***
F_SIZE	0.053	0.176	0.068	0.078	0.174	0.068	0.056	0.171	0.068
	(3.34)***	(5.62)***	(5.58)***	(4.42)***	(5.54)***	(5.68)***	(3.65)***	(5.66)***	(5.46)***
F_LEV	−0.098	−0.268	−0.085	−0.056	−0.256	−0.088	−0.087	−0.238	−0.08
	(−1.79)*	(−2.49)**	(−2.41)**	(−0.94)	(−2.37)**	(−2.54)**	(−1.49)	(−2.26)**	(−2.19)**
IND_SEN	−0.39	−1.14	0.452		−1.479	0.406	−0.094	−1.220	0.497
	(−0.82)	(−1.62)	(1.16)		(−1.65)*	(1.06)	(−0.39)	(−1.41)	(1.24)
F_AGE	0.033	0.002	0.001	0.026	0.002	0.001	0.011	.002	0.001
	(1.83)*	(1.08)	(−0.31)	(0.72)	(1.10)	(−0.45)	(0.27)	(0.92)	(−0.44)
SG_DS_{t-1}	0.43			0.392			0.45		
	(4.68)***			(4.49)***			(5.05)**		
SOC_DS_{t-1}	0.029	0.56			0.553			0.566	

Table 11 (continued)

SG_DS1	*SG_DS* (1)	*SOC_DS* (2)	*GOV_DS* (3)	*SG_DS* (4)	*SOC_DS* (5)	*GOV_DS* (6)	*SG_DS* (7)	*SOC_DS* (8)	*GOV_DS* (9)
		(4.65)***			(4.67)***			(4.87)***	
GOV_DS_{t-1}			0.304			0.327			0.289
			(4.15)***			(4.49)***			(3.84)***
Years fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	870	870	872	870	870	872	870	870	872
N	249	249	249	249	249	249	249	249	249
AR(1) (*P*-value)	0.670	0.288	0.212	0.695	0.284	0.225	0.617	0.267	0.330
AR(2) (*P*-value)	0.162	0.916	0.203	0.656	0.978	0.172	0.104	0.760	0.192
Hansen test (*P*-value)	0.292	0.773	0.524	0.701	0.817	0.365	.273	0.852	0.696
Sargan test (*P*-value)	0.417	0.626	0.595	0.341	0.585	0.554	0.521	0.612	0.607

* Statistical significance at the 10% level

** Statistical significance at the 5% level

*** Statistical significance at 1% level

narcissism score for an average period of 3-year rather than the typical 2-year used in our basic study. Furthermore, we calculate three narcissism indexes.

- NARC_1 is calculated by retaining the CEO who had five years or more of tenure within our time panel instead of considering only those CEOs who had four or more years of tenure.
- NARC_2 is calculated by retaining the CEO who had six years or more of tenure within our time panel.
- NARC_3 is calculated by retaining the CEO who had seven years or more of tenure within our time panel.

The results of the measures NARC_1, NARC_2, and NARC_3 are presented in respectively Panel A, Panel B, and Panel C of Table 11. Observably, the findings remain almost the same likeness provided in our basic models, thus indicating that our results appear to be robust to the alternative CEO narcissism measure.

5 Conclusion

The purpose of this paper was threefold. The first was to examine whether firms led by highly narcissistic CEOs exhibit increased levels of voluntary CSR disclosure. The second was to investigate the eventual moderating effect of CEO duality on the relationship between CEO narcissism and voluntary CSR disclosure. The third was to test whether board gender diversity moderates this relationship.

Next and to deepen our analysis, we introduced the moderating effect of CEO duality and gender diversity. According to agency theory, CEO duality strengthens CEO entrenchment and allows them to focus on maximizing their benefits at the expense of those of shareholders (Jensen and Meckling, 1976; Lassoued and Ben Osman, 2021). In the case of highly narcissistic CEOs, the dual role could provide the opportunity to make decisions that enhance their image.

For board gender diversity, previous studies showed that female presence increases CSR disclosure because women are more inclined toward social matters and the motives to engage in CSR disclosure differ between female directors and highly narcissistic CEOs. Then, we expected that the effect of CEO narcissism is more visible in companies with the presence of women in the board of directors.

We tested these theoretical expectations in a sample of 322 American firms listed on the S&P500 index and observed from 2012 to 2019. To conduct the empirical tests, we calculate a measure of narcissism following (Chatterjee and Hambrick, 2011), and next, we apply the GMM estimator.

The results confirm our hypothesis suggesting that more narcissistic CEOs are interested more in disclosing CSR-related information. Specifically, it has been shown that these CEOs tend to disclose social-related CSR activities and governance-related CSR activities. However, using a relative measure of social disclosure and corporate governance disclosure, it seems that highly narcissistic CEOs favor social disclosure. This finding is explained by the fact that social disclosure gives the CEO the opportunity to play the role of the protagonist receiving reassertions

and applause from "spectators". Indeed, disclosure of these social activities touches and stimulates the interest of stakeholders and the public.

Furthermore, our results supported our hypothesis H2 and sub-hypotheses H2a and H2b, highlighting that the relationship between CEO narcissism and CSR disclosure positively relates to the moderating role of CEO duality. On the other hand, our results also revealed the role of female directors as a moderating factor in the positive relationship between CEO narcissism and CSR disclosure, particularly social CSR activities, confirming thereby hypothesis H3 and sub-hypothesis H3a.

Overall, our results reveal that voluntary CSR disclosure presents a substantial opportunity for more narcissistic CEOs, known for excessive self-admiration, and self-glorification (Gerstner et al., 2013). As stakeholders may experience difficulty recognizing and appreciating firms' CSR efforts, narcissistic CEOs provide them enough CSR information and allocate more attention to CSR voluntary disclosure because they are motivated to have their inflated self-awareness reaffirmed and to win the appreciation and praise of stakeholders. Since CSR voluntary disclosure is useful for stakeholders, more narcissistic CEOs are more likely to gain praise and appreciation because their actions are considerably more visible to stakeholders because they enhance CSR voluntary disclosure. Therefore, the actions of narcissistic CEOs do not come at the expense of stakeholders' interests and they do bring direct benefits to stakeholders through the improvement of CSR voluntary disclosure. Thus, stakeholders and more narcissistic CEOs' incentives are aligned: they both would like to have more CSR voluntary disclosures. This led us to conclude that as CSR disclosure is visible to the public, it easily generates appreciation and praise from stakeholders, thereby offering an appropriate platform for more narcissistic CEOs.

However, it is worth mentioning that while we have shown that CSR disclosure was useful for stakeholders, our findings should be interpreted with caution because highly narcissistic CEOs could engage in selective disclosure practices, disclose fake information, or even choose to disclose the minimum required to impress stakeholders, satisfy activists' demands (Michelon et al., 2020; Ting, 2020) and mostly to satisfy their constant need to reinforce their grandiose self-image. Accordingly, as our results are different from those of Al-Shammari et al. (2019), on the impact of CEO narcissism on corporate governance disclosure, they may indicate the possible presence of a selective disclosure behavior induced by narcissism in our sample.

These findings have many practical implications. *First*, it is preferable to separate the CEO and chairman functions for CEOs with a highly narcissistic personalities because duality vests on them additional power. *Second*, women's presence on the board should be interpreted with care because their positive contribution to CSR disclosure is shown even when this variable is tested separately. Then, the constraint women directors face is that highly narcissistic CEOs do not have to take advantage of their presence to gain admiration from the public. *Third*, it will be relevant for companies to make a concerted effort in standardizing CSR disclosure through a clear procedure. This may also be helpful to prevent the use of these disclosures by highly narcissistic CEOs. *Finally*, we also recommend regulators to switch CSR disclosure from optional to mandatory. By doing so, more narcissistic CEOs will have less discretion to use CSR disclosure for personal purposes.

Although our results are robust across several robustness tests, this study has some limitations that could pave the way for future research. *First*, one of the main limitations is the measure of CEO narcissism. Future research could use an alternative proxy such as the Narcissistic Personality Inventory measure developed by Raskin and Hall (1979), based on 80 items that reflect a set of criteria designed by the American Psychiatric Association and define narcissistic personality disorder. *Second*, we have only examined a sample of 322 firms listed on the S&P500 because of their exposure to the public. Future research may offer new insights by generalizing the findings over international companies. Moreover, this study has examined the effectiveness of CEO duality and board gender diversity as moderators of the relationship between CEO narcissism and CSR disclosure. However, it will be relevant to investigate whether assurance reporting could weaken the main relationship.

Appendix

This study uses the (ESG) scores developed by Bloomberg as a proxy for corporate sustainability (Eccles and Krzus, 2010). Bloomberg (2017, 2019) considers ESG scores based on publicly available organizational communication. The company collects data, grouped into over 200 categories for each monitored organization. The scores display the degree to which a firm reports non-financial information. Indeed, weighted approximately 120 quantitative and qualitative indicators and used different sources (press releases, annual reports, CSR reports, media, etc.). Each category has an industry-specific weight, whose exact specifications represent proprietary information that Bloomberg does not share in detail. Thus, using ESG scores allows the tracking of sustainability performance directly.

The ESG score is calculated based on the amount of environmental, social, and governance information that a company discloses. This score assesses companies' CSR disclosure of their Environmental, Social, and Governance pillars. Each pillar is given a score from 0 to 100 so that the score increases with an increase in the disclosed information.

The social score (S) "is also tailored to different industries. This score measures the amount of social data a company reports publicly and does not measure the company's performance on any data point." The Social score (S) measures, e.g., fair employee treatment, employee training hours, equal opportunities, and policies about safety and wellbeing, as well as the impact that the final products have on society.

The Governance score (G) tracks the structure of the board (e.g., size and diversity) and its functionality (e.g., meetings frequency), an organization's involvement in policy development, and executive remuneration. Board Level Accountability, AntiCorruption, Risk Management, and Tax Transparency. "Each data point is weighted in terms of importance, with Board of Directors data-carrying greater weight than other disclosures. The score is also tailored to different industry sectors".

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